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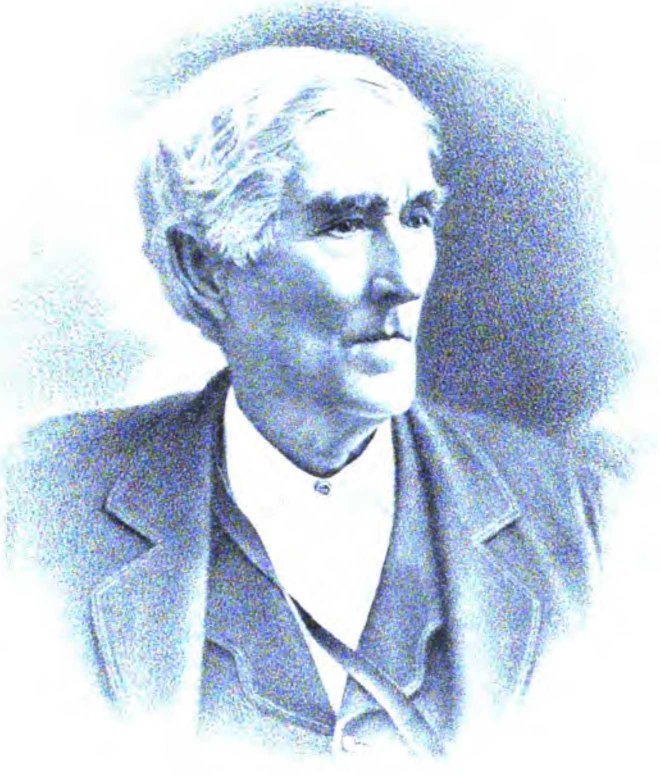

Henry T Sample

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INDIANA

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THIRTY-FIRST ANNUAL REPORT

OF THE

INDIANA

State Board of Agriculture.

VOLUME XXIII. 1881.

INCLUDING THE PROCEEDINGS OF THE ANNUAL MEETING, 1882,
AND OF THE FARMERS' INSTITUTES AT COLUMBUS AND CRAWFORDSVILLE.

TO THE GOVERNOR.

INDIANAPOLIS:
WM. B. BURFORD, STATE PRINTER.
1882.

EXECUTIVE DEPARTMENT,
INDIANAPOLIS, July 7, 1882.

Received March 2, 1882. Examined by the Governor, and deposited with the Secretary of State, to be filed and preserved in his office, and published as may be directed by the Commissioners of Public Printing and Binding.

FRANK H. BLACKLEDGE,
Private Secretary.

Filed in my office March 2, 1882.

E. R. HAWN,
Secretary of State.

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INDIANA STATE BOARD OF AGRICULTURE,
INDIANAPOLIS, March 2, 1882.

To His Excellency,

ALBERT G. PORTER,

Governor of Indiana:

SIR—In compliance with the Act of the General Assembly, approved February 1st, 1852, we have the honor to submit herewith the annual report of the Indiana State Board of Agriculture, for the year ending December 31st, 1881, together with such matter as is deemed interesting and useful.

Very respectfully,

R. M. LOCKHART, President.

ALEX. HERON, Secretary.

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MEMBERS OF STATE BOARD OF AGRICULTURE, 1881.

(Elected by the Delegates from Agricultural Societies.)

1st District—Robert Mitchell, Princeton, Gibson county.
2d District—R. P. Haynes, Montgomery, Daviess county.
3d District—B. H. Hancock, Fredricksburg, Washington county.
4th District—W. B. Seward, Bloomington, Monroe county.
5th District—T. W. W. Sunman, Spades, Ripley county.
6th District—S. R. Quick, Columbus, Bartholomew county.
7th District—Jacob Mutz, Edinburg, Shelby county.
8th District—Joseph Gilbert, Terre Haute, Vigo county.
9th District—W. H. Ragan, Clayton, Hendricks county.
10th District—Henry C. Meredith, Cambridge City, Wayne county.
11th District—John P. Barns, Anderson, Madison county.
12th District—J. K. O'Neal, Lafayette, Tippecanoe county.
13th District—T. M. Kirkpatrick, Kokomo, Howard county.
14th District—L. B. Custer, Logansport, Cass county.
15th District—John Sutherland, Laporte, Laporte county.
16th District—R. M. Lockhart, Waterloo, DeKalb county.

OFFICERS OF THE INDIANA STATE BOARD.

(Elected by the Board of Agriculture.)

OFFICERS FOR 1881.

Hon. R. M. Lockhart,	President.
B. H. Hancock,	Vice President.
Alex. Heron,	Secretary.
Maj. James A. Wildman,	Treasurer.
Hon. Fielding Beeler,	General Supt.

EXECUTIVE COMMITTEE.

Hon. R. M. Lockhart, *President ex-officio.*
Robt. Mitchell, Jacob Mutz,
W. H. Ragan, S. R. Quick.

A TABLE, *showing the Officers, Place and Receipts of each Fair held by the State Board of Agriculture.*

Year.	PRESIDENT.	SECRETARY.	TREASURER.	GENERAL SUPERINTENDENT.	Place of Fair.	Premiums Paid.	Receipts of Fair.
1852	Gov. Joseph A. Wright	John B. Dillon	Royal Mayhew	W. T. Dennis	Indianapolis	......	$4,651 55
1853	Gov. Joseph A. Wright	John B. Dillon	Royal Mayhew	J. J. Bingham	Lafayette	......	6,751 55
1854	Gov. Joseph A. Wright	Wm. T. Dennis	Royal Mayhew	W. T. Dennis	Madison	......	7,430 77
1855	Gen. Joseph Orr	John B. Dillon	S. A. Buell	Calvin Fletcher, Jr	Indianapolis	$3,753 00	10,823 75
1856	Dr. A. C. Stephenson	Ignatius Brown	S. A. Buell	Calvin Fletcher, Jr	Indianapolis	4,225 00	14,373 34
1857	Dr. A. C. Stephenson	Ignatius Brown	S. A. Buell	Calvin Fletcher, Jr	Indianapolis	4,127 00	14,058 75
1858	Dr. A. C. Stephenson	John B. Dillon	Thomas H. Sharp	Calvin Fletcher, Jr	Indianapolis	......	11,500 00
1859	George D. Wagner	John B. Dillon	Thomas H. Sharp	James L. Bradley	New Albany	6,163 00	8,599 50
1860	George D. Wagner	Wm. T. Dennis	Thomas H. Sharp	James L. Bradley	Indianapolis	3,827 00	11,902 00
1861	D. P. Holloway	Wm T. Dennis	H. A. Fletcher	......	No Fair	......	......
1862	James D. Williams	W. H. Loomis	H. A. Fletcher	J. A. Grosvenor	Indianapolis	3,994 00	4,124 08
1863	A. D. Hamrick	W. H. Loomis	H. A. Fletcher	J. A. Grosvenor	Indianapolis	......	9,553 82
1864	Stearns Fisher	W. H. Loomis	Francis King	W. H. Loomis	Indianapolis	4,121 00	10,785 50
1865	Stearns Fisher	W. H. Loomis	Carlos Dickson	J. A. Grosvenor	Fort Wayne	4,078 00	11,597 55
1866	Stearns Fisher	W. H. Loomis	Carlos Dickson	J. A. Grosvenor	Indianapolis	......	17,179 36
1867	A. D. Hamrick	A. J. Holmes	Carlos Dickson	J. B. Sullivan	Terre Haute	6,331 00	17,148 05
1868	A. D. Hamrick	A. J. Holmes	Carlos Dickson	J. B. Sullivan	Indianapolis	7,087 00	16,799 00
1869	A. D. Hamrick	A. J. Holmes	Carlos Dickson	J. B. Sullivan	Indianapolis	7,517 00	22,345 65
1870	J. D. Williams	Joseph Poole	Carlos Dickson	J. S. Benson	Indianapolis	7,914 00	19,155 23
1871	J. D. Williams	Joseph Poole	Carlos Dickson	Jacob Mutz	Indianapolis	8,564 00	20,549 90
1872	John Sutherland	Alex. Heron	Carlos Dickson	H. W. Caldwell	Indianapolis	9,619 20	23,484 35
1873	John Sutherland	Alex. Heron	Carlos Dickson	H. W. Caldwell	Indianapolis	8,864 75	52,309 10
1874	John Sutherland	Alex. Heron	Carlos Dickson	E. J. Howland	Indianapolis	10,754 00	45,330 48
1875	William Crim	Alex. Heron	Carlos Dickson	E. J. Howland	Indianapolis	12,068 20	43,214 99
1876	Hezekiah Caldwell	Alex. Heron	Carlos Dickson	J. L. Hanna	Indianapolis	8,179 30	6,342 70
1877	Jacob Mutz	Alex. Heron	Carlos Dickson	J. W. Furnas	Indianapolis	6,337 95	14,511 00
1878	W. R. Seward	Alex. Heron	Carlos Dickson	R. M. Lockhart	Indianapolis	5,057 00	15,991 33
1879	Robert Mitchell	Alex. Heron	Carlos Dickson	R. M. Lockhart	Indianapolis	5,472 00	22,919 50
1880	W. H. Ragan	Alex. Heron	J. A. Wildman	Fielding Beeler	Indianapolis	6,553 00	18,809 05
1881	R. M. Lockhart	Alex. Heron	J. A. Wildman	Fielding Beeler	Indianapolis	6,855 50	17,874 00
1882	H. C. Meredith	Alex. Heron	J. A. Wildman	Fielding Beeler	Indianapolis	......	......

A. C. Jameson filled the office of Treasurer for 1873, to the 27th of August, 1873, when he resigned, and Carlos Dickson was appointed to fill the unexpired term.

NOTE.—In consequence of the loss of papers, incident to the military occupancy of the rooms of the State Board of Agriculture, during the late war, and incomplete records preserved, the amount of premiums awarded at the several State Fairs is necessarily incomplete.

STATE INDUSTRIAL ASSOCIATIONS.

OFFICERS FOR THE YEAR 1882.

HEAD-QUARTERS IN THE AGRICULTURAL ROOMS, CORNER OF TENNESSEE AND MARKET STREETS.

Indiana State Board of Agriculture.—President, Hon. H. C. Meredith, Cambridge City, Wayne county; Secretary, Alex. Heron, Indianapolis, Marion county. Organized May, 1851.

Indiana Horticultural Society.—President, Sylvester Johnson, Irvington, Marion county; Secretary, Hon. W. H. Ragan, Clayton, Hendricks county. Organized 1842.

State Association of Short Horn Breeders.—President, Hon. Thomas Nelson, Bloomingdale, Parke county; Secretary, T. W. W. Sunman, Spades, Ripley county. Organized May, 1872.

Indiana Dairymens' Association.—President, J. E. Thompson, Waterloo, DeKalb county; Secretary, G. C. Stevens, Richmond, Wayne county. Organized September, 1876.

Indiana Swine Breeders' Association.—President, Richard Jones, Columbus, Bartholomew county; Secretary, W. A. Macy, Lewisville, Henry county. Organized January, 1877.

Indiana Wool Growers' Association.—President, Fielding Beeler, Indianapolis, Marion county; Secretary, J. W. Robe, Greencastle, Putnam county. Organized October, 1876.

Indiana Poultry Breeders' Association.—President, H. C. G. Bals, Indianapolis, Marion county; Secretary, D. H. Jenkins, Indianapolis, Marion county. Organized January, 1875.

Indiana Bee Keepers' Association.—President, I. N. Cotton, Traders' Point, Marion county; Secretary, F. L. Daugherty, Indianapolis. Organized October, 1879.

Indiana Tile Makers' Association.—President, Robert Thomas, Indianapolis; Secretary, J. J. W. Billingsley, Marion county. Organized November, 1876.

Indiana Womens' State Industrial Association.—President, Mrs. Dr. M. E. Haggart, Indianapolis, Marion county; Secretary, Mrs. F. M. Adkinson, Indianapolis, Marion county. Organized September, 1878.

METEOROLOGICAL TABLES.

WAR DEPARTMENT,
OFFICE OF THE CHIEF SIGNAL OFFICER,
WASHINGTON CITY, April 5, 1882.

Mr. Alex. Heron, Secretary of the Indiana State Board of Agriculture, Indianapolis, Ind., (care U. S. Signal Office):

SIR—Referring to your request to Sergeant Otto Schütze, I have the honor to enclose herewith extracts from the records of this office.

I am, very respectfully, your obedient servant,

W. B. HAZEN,
Brig. and Bvt. Major-General, Chief Signal Officer, U. S. A.

MONTHLY MEAN BAROMETER, THERMOMETER, ETC.

TABLE *showing Monthly Mean Barometer, Thermometer and Relative Humidity; Maximum and Minimum Temperatures; Prevailing Direction of Wind; number of Clear, Fair and Cloudy Days; average amount of Cloudiness; number of Days on which* 0.01 *Inches or more of Rain or Snow fell; total amount of Rainfall, and number of Days on which Temperature fell below Freezing Point, at Indianapolis, Ind., for each Month of the Year* 1881, *as recorded at the United States Signal Office:*

1881. MONTHS.	Mean Barometer, Inches.	Mean Thermometer, Degrees.	Mean Relative Humidity, Per Cent.	Maximum Temperature, Degrees.	Minimum Temperature, Degrees.	Prevailing Direction of Wind.	No. of Clear Days.	No. of Fair Days.	No. of Cloudy Days.	Average Cloudiness During Month, Scale 0.10.	No. of days on which 0.01 inch or more of Rain or Snow fell, Inches.	Total Amount of Rain or Melted Snow, Inches.	No. of Days on which Temperature fell below freezing point.
January	30.136	24.2	73.6	47	—6	N.	4	9	18	6.7	5	2.10	28
February	30.092	30.3	73.8	59	1	E.	3	10	15	7.0	11	6.43	21
March	29.824	37.3	71.1	62	18	W.	3	9	19	7.5	12	4.01	18
April	29.963	48.0	61.0	78	20	W.	6	12	12	5.4	10	2.60	7
May	29.957	71.3	55.4	89	44	N.	15	10	6	3.5	10	3.78	0
June	29.896	73.4	66.3	92	48	SW.	5	18	7	4.8	10	3.92	0
July	29.985	79.4	60.1	101	57	W.	15	15	1	2.9	4	0.82	0
August	29.995	79.0	51.6	101	55.5	E.	16	12	3	2.8	4	0.97	0
September	30.007	73.5	65.1	94.5	48	SW.	12	12	6	3.5	8	3.25	0
October	30.120	60.1	77.4	81	39	SW.	7	13	11	5.7	15	6.11	0
November	30.153	42.8	74.1	63	10	S.	7	11	12	5.6	11	9.35	10
December	30.160	40.2	77.0	63	14	S.	7	9	15	6.4	12	5.40	12
Annual Means and totals.	30.024	54.9	67.4	101	—6	SW.	100	140	125	5.2	112	48.74	96

Prepared at the United States Signal Office, Indianapolis, Ind.

Examined at the office of the Chief Signal Officer United States Army at Washington, D. C., and found to be correct.

DAILY AND MONTHLY MEAN BAROMETER.

TABLE *showing Daily and Monthly Mean Barometer at Indianapolis, Ind., for each day and month of the year* 1881, *as recorded at the United States Signal Office.*

DAILY MEAN BAROMETER—ENGLISH INCHES.

DATE.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1 . . .	30.203	30.286	30.021	30.059	30.068	29.762	30.106	30.059	30.022	30.256	30.030	30.316
2 . . .	30.254	30.309	29.723	30.148	30.134	29.654	30.178	30.030	29,998	30.201	29.815	30.342
3 . . .	30.314	30.365	29.487	29.956	30.221	29.785	30.144	30.043	29.957	30.173	29.963	30.309
4 . . .	29.997	30.494	29.533	30.007	30.133	29.950	30.056	30.038	29.921	30.137	29,856	30.357
5 . . .	29.710	30.422	29.746	29.949	29.936	29.791	30.019	29,990	30.025	30.403	29.977	30.309
6 . . .	29.867	30.315	30.102	30.005	29.968	29.817	29.995	29.922	30.096	30.269	30.145	29.874
7 . . .	30.450	30.210	30.056	29.869	29.901	29.765	29.960	29.986	30.111	30.202	29.960	30.123
8 . . .	30.383	29.971	29.813	29.759	29.874	29.756	29.973	30.011	30.084	30.148	30.056	30.066
9 . . .	30.185	29.482	30.020	30.017	29.850	29.933	30.013	29.851	30.043	30.217	30.457	30.306
10 . . .	30.209	29.952	30.034	30.138	29.931	30.035	30.026	29.893	29.940	30.392	30.555	30.503
11 . . .	30.207	29.546	29.812	29.902	30.049	30.000	29.989	29.899	30.137	30.187	30.088	30.235
12 . . .	29.911	29.600	29.432	29.758	30.113	29.925	29.930	29.822	30.114	30.119	29.775	30.023
13 . . .	29.693	30.166	29.985	29.929	30.022	29.888	29.970	29.880	30.121	30.260	29.930	29.910
14 . . .	30.199	30.459	30.235	29.842	29.847	30.024	30.011	30.013	29.973	30.124	30.337	30.296
15 . . .	29.837	30.217	30.052	29.761	29.811	30.089	30.050	30.094	29,618	30.056	30.599	30.554
16 . . .	30.086	30.483	29.849	30.023	29.955	29.928	29.988	30.057	29.899	30.226	30.372	30.416
17 . . .	30.560	30.353	29.980	29.840	29.954	29.918	29.926	29.971	30.163	30.021	30.074	30.355
18 . . .	30.355	29.904	29.867	39.801	29.962	29.852	29.924	29.861	30.184	30.246	29.910	30.439
19 . . .	30.136	30.225	29.245	29.914	29.881	29.880	29.870	29.921	30.068	30.213	30.293	30.352
20 . . .	29.581	30.129	29.564	29.984	29.903	29.833	29.814	29.889	29.995	30.211	30.465	30.174
21 . . .	29.684	30.219	29.758	30.045	29.957	29.890	29.758	29.914	29.993	30.255	30.335	29.996
22 . . .	30.014	29.978	29.846	30.101	29.997	29.963	29.795	30.032	29.981	30.183	30.290	29.775
23 . . .	30.209	30.301	29.756	30.117	30.038	30.039	29.933	30.119	29.988	29.965	30.119	30.140
24 . . .	30.231	29.982	29.811	29.982	30.055	30.061	29.892	30.177	29.899	29.823	30.298	30.327
25 . . .	30.296	30.096	29.920	29.747	30.060	29.987	29.911	30.118	29.967	29.898	30.188	30.205
26 . . .	30.361	29.788	30.135	29.896	30.051	29.938	29.974	30.054	29.942	30.015	30.195	30.039
27 . . .	30.532	29.479	30.031	29.908	29.930	29.820	30.010	30.034	29.931	30.012	30.215	29.871
28 . . .	30.598	29.835	29.763	29.973	29.785	29.816	30.031	29.999	30.021	29.804	30.211	29.785
29 . . .	30.163	. . .	29.743	30.232	29.727	29.832	30.061	29.994	29.987	29.815	30.108	29.814
30 . . .	30.081	. . .	29.602	30.235	29.755	29.945	30.108	30.102	30.034	29.905	29.936	29.865
31 . . .	29.923	. . .	29.626	. . .	29.786	. . .	30.114	30.064	. . .	29.988	. . .	29.874

MONTHLY MEAN BAROMETER.

	30.136	30.092	29.824	29.963	29.957	29.896	29.985	29.995	30.007	30.120	30.153	30.160

Prepared at the United States Signal Office, Indianapolis, Ind.

Examined at the office of the Chief Signal Officer United States Army, Washington, D. C., and found to be correct.

DAILY AND MONTHLY MEAN TEMPERATURE.

TABLE *showing Daily and Monthly Mean Temperature, at Indianapolis, Ind., for each day and month of the year* 1881, *as recorded at the United States Signal Office.*

DAILY MEAN THERMOMETER—(° FAHR.)

DATE.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1 . . .	18.5	17.7	26.2	24.2	56.7	71.5	70.0	79.0	78.0	68.2	53.0	38.0
2 . . .	26.7	18.0	37.7	30.6	61.1	71.1	75.0	82.7	74.8	72.3	50.7	39.7
3 . . .	23.4	13.5	29.0	31.5	57.5	58.9	78.8	85.5	75.3	72.7	40.2	40.0
4 . . .	23.0	13.4	24.4	27.5	61.0	66.4	81.2	85.7	79.3	64.0	45.7	35.7
5 . . .	30.5	19.5	28.7	29.7	63.6	63.6	83.7	86.7	84.8	49.2	47.7	38.5
6 . . .	29.2	35.1	33.6	35.1	66.0	65.0	86.3	84.0	85.5	56.3	51.5	46.2
7 . . .	10.1	38.4	40.6	39.2	73.5	75.5	86.8	70.7	84.3	66.7	56.7	31.7
8 . . .	12.1	45.6	38.1	38.7	74.0	70.7	88.5	74.3	82.3	69.5	56.0	36.7
9 . . .	18.4	50.9	40.5	41.5	74.0	66.4	89.3	85.5	77.3	61.3	44.3	34.7
10 . . .	13.7	38.5	42.0	45.6	75.4	67.6	90.8	82.3	74.7	53.8	41.8	30.7
11 . . .	14.1	41.7	37.5	45.5	80.4	73.2	90.0	82.3	61.0	60.0	46.3	37.3
12 . . .	31.5	23.5	44.7	42.6	81.2	77.9	91.2	89.5	66.0	70.7	48.2	50.3
13 . . .	31.1	18.5	32.9	37.9	81.0	78.5	85.3	77.0	66.5	63.0	45.3	56.0
14 . . .	7.6	17.9	35.9	43.9	71.4	77.6	79.3	68.2	68.7	64.3	38.7	36.0
15 . . .	22.2	30.9	50.1	40.7	65.4	78.5	81.7	70.0	64.2	70.3	33.3	32.3
16 . . .	25.2	19.8	53.5	49.4	61.6	83.1	83.7	72.7	59.8	62.7	47.3	38.0
17 . . .	22.2	27.6	41.2	60.2	64.1	78.6	74.0	76.3	60.7	69.3	56.0	44.0
18 . . .	28.5	35.2	43.7	57.9	64.2	78.2	72.0	77.2	60.7	48.0	45.0	44.3
19 . . .	33.1	32.2	40.7	54.2	67.4	77.2	75.2	75.0	65.8	47.7	29.7	47.3
20 . . .	34.9	36.0	33.7	56.0	69.9	75.9	76.3	77.0	72.0	49.7	29.2	49.3
21 . . .	31.2	31.2	34.0	52.7	68.9	69.0	82.7	73.7	75.0	53.3	35.3	53.7
22 . . .	28.7	40.4	33.2	59.1	73.7	64.7	75.2	71.7	76.5	58.3	36.8	46.7
23 . . .	25.2	24.1	38.6	63.7	74.7	67.0	74.8	71.3	77.3	60.3	29.0	37.5
24 . . .	25.4	32.9	45.5	67.6	75.5	73.0	78.0	71.8	78.0	54.7	18.3	38.0
25 . . .	26.4	34.1	37.9	69.1	78.0	74.5	75.7	75.0	80.0	53.5	28.7	42.5
26 . . .	19.5	51.9	33.4	62.0	78.6	77.2	70.3	80.7	76.0	53.8	36.3	46.3
27 . . .	14.0	39.1	41.6	62.0	78.5	78.2	69.8	83.2	74.7	59.7	41.0	46.0
28 . . .	16.5	22.2	42.0	58.2	80.0	82.4	71.3	82.7	73.7	60.0	44.3	49.7
29 . . .	33.5	. . .	30.0	57.0	80.6	84.7	71.7	87.0	77.7	63.2	52.0	38.0
30 . . .	38.7	. . .	30.0	57.2	77.6	76.1	75.3	88.3	75.3	57.8	56.0	19.7
31 . . .	34.1	. . .	33.9	. . .	74.4	. . .	77.7	81.8	. . .	50.3	. . .	21.3

MONTHLY MEAN THERMOMETER—(° FAHR.)

	24.2	30.3	37.3	48.0	71.3	73.4	79.4	79.0	73.5	60.1	42.8	40.2

Prepared at the United States Signal Office, Indianapolis, Ind.

Examined at the office of the Chief Signal Officer United States Army, Washington, D. C., and found to be correct.

ANNUAL MEAN BAROMETER, THERMOMETER AND HUMIDITY, ETC.

TABLE *showing annual Mean of Barometer, Thermometer and relative Humidity; the highest and lowest Temperature; Prevailing Direction of Wind; number of Clear, Fair and Cloudy Days; the average amount of Cloudiness; number of days on which* 0.01 *inch, or more, of Rain or Snow fell; total Rainfall; greatest Rainfall in twenty-four consecutive hours; number of days on which maximum or minimum Temperature was below freezing point, and number of days on which Thermometer rose above* 90°, *at Indianapolis, Ind., for each year of the Decade ending December* 31, 1881, *as recorded at the United States Signal Office.*

YEARS.	Annual Mean Barometer — English Inches.	Annual Mean Thermometer—Degrees Fahrenheit.	Annual Mean Relative Humidity—Per cent.	Highest Temper't're during year—Degrees Fahrenheit.	Lowest Temperature during year—Degrees Fahrenheit.	Prevailing Direction of Wind.	Number of Clear Days.	Number of Fair Days.	Number of Cloudy Days.	Average amount of Cloudiness — Scale 0.10.	Number of days on which 0.01 inch, or more, of Snow or Rain fell.	Total amount Rain and melted Snow—Inches.	Greatest Rainfall in 24 consecutive Hours—Inches.	Number of days on which Maximum Temperature was below freezing point.	Number of days on which Minimum Temperature was below freezing point.	Number of days on which Temper't're rose above 90°.
1872 . .	30.044	50.8	67.5	96	—11	SW.	85	142	139	5	122	34.07	3.71	49	120	17
1873 . .	30.004	52.0	69.2	95	—13	SW.	97	141	127	5	145	52.32	3.73	38	99	9
1874 . .	30.037	55.0	63.0	97	— 2	NW.	97	150	118	5	120	43.60	2.61	17	83	27
1875 . .	30.005	50.5	66.1	92	—18.5	W.	81	138	146	5	155	54.58	2.86	44	107	5
1876 . .	29.997	53.2	68.1	93	—15	W.	83	126	157	6	155	57.53	2.70	30	101	9
1877 . .	30.008	54.0	67.2	90	—11	SW.	98	141	126	5	139	39.08	2.07	20	84	0
1878 . .	29.946	55.4	64.6	96	—12	SE.	84	159	122	6	148	38.62	2.03	17	68	13
1879 . .	30.036	53.9	64.4	96	—22	S.	94	135	136	5	122	42.88	2.33	27	98	12
1880 . .	30.030	54.4	65.4	94	—13	W.	106	145	115	5	123	50.99	2.00	26	91	9
1881 . .	30.024	54.9	67.4	101	— 6	SW.	100	140	125	5	112	48.74	4.30	28	96	31

A slight shock of earthquake was felt at 0.17 A. M., September 25, 1876. The motion lasted about three seconds, and apparently was from East to West. A tornado passed over the northeast part of Indianapolis during the evening of March 4, 1880.

CONSTITUTION

OF THE

INDIANA STATE BOARD OF AGRICULTURE,

—AS—

Revised and Adopted at the January Meeting of the Board, 1860.

ARTICLE 1. The name and style of this society shall be "The Indiana State Board of Agriculture;" its objects, to promote and improve the condition of agriculture, horticulture, and the mechanic, manufacturing and household arts.

ART. 2. There shall be held at the city of Indianapolis, at such time as may be prescribed by law, an annual meeting of the State Board of Agriculture, together with Presidents, or other delegates duly authorized, from each county, or such other agricultural society as may be authorized by law to send delegates, who shall, for the time being, be *ex-officio* members of the State Board of Agriculture, for the purpose of deliberation and consultation as to the wants, prospects and condition of the agricultural interests throughout the State; and at such annual meetings the several reports from county societies shall be delivered to the President of the State Board of Agriculture; and the said President and delegates shall, at this meeting, elect suitable persons to fill all vacancies in this Board: *Provided, however,* That said election shall not affect the members of the Board present, whose terms shall not be considered to expire until the last day of the session.

ART. 3. The State Board elect shall meet immediately after the adjournment of the State Board, for the purpose of organization, and for the transaction of such other business as the wants and interests of the society may require; and hold such other meetings, from time to time, for making out premium lists, preparing for State Fairs, and all other business necessary to the promotion of the objects of the society.

ART. 4. The State Board elect shall consist of sixteen members, chosen from the following districts:

First District.—Posey, Vanderburgh, Gibson, Warrick and Spencer counties.

Second District.—Pike, Dubois, Martin, Daviess, Knox and Sullivan counties.

Third District.—Perry, Crawford, Harrison, Floyd and Washington counties.

Fourth District.—Orange, Lawrence, Jackson, Monroe, Greene, Brown and Scott counties.

Fifth District.—Clark, Jefferson, Switzerland, Jennings, Ohio and Ripley counties.

Sixth District.—Dearborn, Franklin, Decatur, Bartholomew and Rush counties.

Seventh District.—Johnson, Shelby, Morgan and Marion counties.

Eighth District.—Owen, Clay, Vigo, Parke and Vermillion counties.

Ninth District.—Putnam, Hendricks, Montgomery and Boone counties.

Tenth District.—Fayette, Wayne, Union and Henry counties.

Eleventh District.—Randolph, Delaware, Madison, Hancock, Hamilton, Tipton and Jay counties.

Twelfth District.—Clinton, Fountain, Tippecanoe, Warren, Newton, Benton and White counties.

Thirteenth District.—Blackford, Grant, Huntington, Wells, Adams, Wabash and Howard counties.

Fourteenth District.—Carroll, Cass, Miami, Fulton, Pulaski, Jasper and Starke counties.

Fifteenth District.—Marshall, Laporte, St. Joseph, Lake, Porter and Elkhart counties.

Sixteenth District.—Allen, Lagrange, Whitley, DeKalb, Noble, Steuben and Kosciusko counties.

Chosen for two years, one half of whose terms expire every year, to-wit: those representing the first, second, third, fourth, seventh, fourteenth, fifteenth and sixteenth, expire at the annual meeting of 1860, and those representing the fifth, sixth, eighth, ninth, tenth, eleventh, twelfth and thirteenth districts, expire at the annual meeting, to be held in January, 1861. To be chosen by ballot.

ART. 5. It shall be the duty of the President to preside at all meetings, conduct the business in an orderly and parliamentary manner, and officially sign all vouchers and drafts upon the Treasurer, (except for premiums,) and all other instruments requiring the same, and call special meetings in cases of emergency.

ART. 6. The State Board elect shall, at the annual meeting after the adjournment of the delegate meeting, proceed to elect one of their number President, who shall hold his office for the term of one year and until his successor is elected and qualified, and one of their number for Vice President, whose term shall be the same as President, who shall act, and, for the time being, have all the power as President, whenever the President is absent from any regular meeting. They shall also elect some suitable person as Secretary, and some suitable person as Treasurer, and a General Superintendent, who shall hold their offices each for one year, unless removed for incompetency or neglect of duty. They shall also elect four of their number, who shall, with the President, constitute an Executive Committee, who shall have power to act in cases of emergency, where loss would result by waiting till a regular meeting of the Board, but shall have no power whatever during the meeting of the Board.

ART. 7. It shall be the duty of the Treasurer to safely keep the funds belonging to the society, pay out the same on orders or drafts drawn by the Secretary, and report annually to the State Board, and as much oftener as he may be called upon by the Board, and shall give bond for the faithful performance of his duties.

ART. 8. It shall be the duty of the General Superintendent to take care of and carefully keep, all property belonging to the society, have the care and control of the fair grounds during the recess; have the supervision and oversight of such improvements or additions as may be directed by the State Board, and, under their direction, procure materials, contract for labor, and shall be, during the continuance of a Fair, the Chief Marshal and head of the police. The members of the Board shall employ all the necessary police and gate-keepers.

ART. 9. The Secretary shall keep a true record of the proceedings. He shall conduct all correspondence on behalf of the society, except when otherwise directed by the president. He shall, by himself and assistants by him appointed, arrange the details of the entries, tickets, and enroll the names of committees and judges of the State Fair, receive and record the various reports of the awarding committees, fill out and deliver all diplomas and certificates. It shall be the duty of the Secretary to condense the County Agricultural Reports for each year into one volume, and superintend the publishing of the same. He shall audit and file all accounts against the Board; draw orders in favor of the proper persons on the Treasurer for the amount; but orders shall not be drawn payable to order or bearer, but to the name of the party alone, or his agent. He shall make an annual report, showing the amount of all orders upon the treasury, and shall perform such other duties as the best interests of the society may demand; but he is at all times subject to the direction and control of the State Board.

ART. 10. At the annual meeting of the Board the salaries of the Treasurer, Secretary and Superintendent shall be fixed for the ensuing year: *Provided*, That said Board may, in their discretion, at any meeting of said Board, make said officers an additional allowance for *extra* services.

ART. 11. That no compensation shall be allowed to delegates attending the annual meeting of the State Board; nor shall the members of the State Board elect be paid any sum of money, as compensation or otherwise, except by order of the Board elect.

ART. 12. The State Board may adjourn from time to time, or they may be called together by the Secretary, by order of the President, by a written notice to each member, enclosed by mail, and a notice of such meeting published in two or more newspapers of general circulation, in the city of Indianapolis; and all meetings so held by adjournment, or calls, shall be deemed regular and legal.

ART. 13. Any alteration or amendment to this Constitution may be made at the annual meeting of the State Board, two-thirds of all the members voting for such amendment.

ART. 14. The following standing committees shall be appointed by the President, to whom all matters of business coming up for reference under their particular heads, shall be referred, unless otherwise specially directed by the Board:

1. Finance and Claims.
2. Rules and Regulations.
3. Fair Grounds.
4. Unfinished Business.
5. Geological Survey—Executive Committee, *ex-officio*.
6. Premium List.

AMENDMENTS TO THE CONSTITUTION.

At the May meeting in 1851, certain rules, embracing ten sections, for the government of county agricultural societies, were adopted by the Board of Agriculture, as required in Section 1 of the statute laws enacted by the Legislature of Indiana, for the "Encouragement of Agriculture," approved February 17, 1852.

At the February meeting of 1868, the rules were found inexpedient and repealed, and the following resolutions submitted by the Committee on Rules and Regulations were adopted:

Resolved, That all county and district societies shall be organized and governed by the laws of the State of Indiana in regard to agricultural societies, and especially under the act passed by the Legislature and approved February 17, 1852.

Resolved, That all societies so organized will be entitled to send delegates to this Board, (State Board of Agriculture,) at its annual meetings, and will be received and acknowledged upon the presentation of their reports and credentials and compliance with the laws as legally organized societies.

STATE BOARD MEETINGS, 1881.

Agricultural Rooms,
Thursday Morning, Jan. 6, 1881.

MEETING OF OLD BOARD.

Board met, President Ragan in the chair. On call of the roll, Messrs. Mitchell, Haynes, Hancock, Seward, Cofield, Quick, Mutz, Ragan, Barns, Custer and Lockhart answered to their names.

The minutes of the last meeting of the Delegate Board and Board Proper, and Executive Committee, were read and approved.

President Ragan announced the improved condition of Mr. Sutherland, who was seriously ill.

There being no other business presented, on motion, the Board adjourned.

ORGANIZATION OF NEW BOARD.

Board met. On motion of Mr. Seward, the Board, with new members, proceeded to reorganize.

On motion, Mr. Seward was selected temporary chairman.

The Secretary called the roll. The following named members answered to the call: Messrs. Mitchell, Haynes, Hancock, Seward, Sunman, Quick, Mutz, Gilbert, Ragan, Barns, O'Neal, Kirkpatrick, Custer and Lockhart.

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* Note—The condensed proceedings of the Board of Agriculture, as herewith presented, includes only such matter as may be useful for reference or of general interest.

On motion of Mr. Ragan, the Board proceeded to the election of officers.

Mr. O'Neal being a member of the Legislature, asked to be excused from the meeting, which was granted.

On motion of Mr. Haynes, Messrs. Sunman and Gilbert were appointed to act as tellers.

The election resulted as follows:

President. . . . . R. M. Lockhart, of DeKalb County.
Vice President . . . . B. H. Hancock, of Washington County.
Secretary. . . . . Alex. Heron, of Marion County.
Treasurer . . . . J. A. Wildman, of Marion County.
General Superintendent . . . . Fielding Beeler, of Marion County.

Executive Committee.

Robert Mitchell, of Gibson County.
Jacob Mutz, of Shelby County.
W. H. Ragan, of Hendricks County.
S. R. Quick, of Bartholomew County.

Messrs. Mitchell, Mutz and Ragan were selected to conduct the newly-elected President to the chair.

President Lockhart, on taking the chair, returned thanks to the Board for this mark of consideration and expressed an earnest desire for their hearty co-operation in the discharge of the duties of the office.

In response to a call from the meeting, Mr. Ragan, the retiring president, made some timely remarks congratulating the newly elected president, and wishing him all felicity in his arduous position.

Mr. Seward called for the appointment of the Committee requested in the resolutions of Mr. Ratliff adopted by the delegate Board, to make application to the Legislature for relief.

The President appointed Messrs Ragan, Mutz and Seward the Committee.

On motion of Mr. Seward, the President was added to the Committee.

On motion of Mr. Mitchell, Mr. Barnes was added to the Committee.

Mr. Mitchell moved that preparations for the coming Fair be commenced one week previous, which, after much discussion, was withdrawn and the following resolution offered by Mr. Mitchell was adopted.

Resolved, That the Indiana State Fair begin Monday, September 26th, 1881.

On motion of Mr. Quick, the time of holding the February meeting was fixed on the 8th proximo, at 10 o'clock, a. m.

After appointing a meeting of the Executive Committee for 1.30 o'clock, the Board adjourned.

MEETING OF EXECUTIVE COMMITTEE.

AGRICULTURAL ROOMS,
January 6, 1881, 1:30 o'clock, P. M.

All the members present, namely: Messrs. Mitchell, Mutz, Ragan and Quick.

On motion of Mr. Mutz, Messrs. Heron, Secretary, Wildman, Treasurer, and Ragan, were appointed a sub-committee of the regular committee to prepare a bill for relief, to be presented to the Legislature.

On motion of Mr. Ragan, the Secretary, Treasurer and General Superintendent were authorized to settle damages to horse incurred on bridge across State ditch in front of Fair Grounds, and the General Superintendent was ordered to enclose by fence the grounds of the Board, now lying vacant on the south of the present enclosure.

The bond of Treasurer Wildman was approved, and the President and Secretary authorized to accept the same when properly acknowledged by a notary public.

On motion the committee then adjourned.

FEBRUARY MEETING OF BOARD, 1881.

FIRST DAY.

MORNING SESSION.

TUESDAY, Feb. 8, 10 o'clock, A. M.

Board met pursuant to adjournment, President Lockhart in the chair. Members present were: Messrs. Mitchell, Haynes, Hancock, Sunman, Quick, Mutz, Ragan, Kirkpatrick, Custer and Lockhart.

The minutes of the last January meeting of the Board were read, corrected and approved.

Memoranda of the business of the meeting was submitted by the Secretary to the President.

Mr. Mitchell, of Gibson county, announced the death of T. V. Mitchell, of Rush county, former member of this Board from the sixth district.

On motion, the President appointed Messrs. Mitchell, Ragan and Quick a committee to draft resolutions expressive of the sense of the Board in relation thereto.

The Secretary read a communication from H. B. Dickson, of the South Bend Iron Works, offering as a premium a Cassady sulky plow, valued at $50, to be competed for by boys under eighteen years of age, at next State Fair, for best display of agricultural products, which elicited considerable discussion and inquiry as to the feasibility of another field trial, at Purdue University, similar to that of 1876.

On motion of Mr. Mutz, further consideration of the matter was deferred until to-morrow.

Mr. Ragan offered a resolution with regard to foreign immigration to this State.

Mr. Mitchell moved that the Chair appoint a Committee of three to consider the subject of foreign immigration, with power to consider and amend the resolution offered by Mr. Ragan, which was carried, and Messrs. Ragan, Mitchell and Mutz were appointed the Committee.

The Secretary presented a communication from J. A. Foote, of Terre Haute, concerning premiums for certain potatoes to be exhibited at next State Fair, which was referred to the Committee on Premium List.

A communication was received and read from Francis D. Moulton relating to the adulteration of food, which, on motion of Mr. Mutz, was ordered to be placed on file and the Secretary directed to place in the hands of each member of the Board a petition to which to obtain signatures and to forward the same to Mr. Moulton.

The Secretary read a communication from Mr. Farley, of Toledo, Ohio, concerning the Fair Circuit.

On motion of Mr. Mitchell, the President and Secretary were appointed as members of the Fair Circuit Executive Committee, with power to act for the Board.

Mr. Custer moved that the State Board join the National Trotting Association.

Mr. Mutz moved to make the consideration of the subject a special order for to-morrow afternoon, which was carried.

A communication from Chief Fire Engineer Pendergast, relating to the building of a cistern for fire purposes near the Exposition Building, was referred to the General Superintendent.

On motion of Mr. Ragan, that a Committee be appointed to which be referred the requests made by the Woman's Department at the January meeting, Messrs. Haynes, Custer and Sunman were appointed the Committee.

By consent, the offer of Mr. Dickson, of the South Bend Iron Works, of a sulky plow as special premium to boys under 18 years for display of agricultural products, was referred to the Committee on Premium List.

Adjourned to 2 o'clock.

AFTERNOON SESSION.

TWO O'CLOCK, P. M.

Board met, President Lockhart in the Chair. Present, Messrs. Mitchell, Haynes, Hancock, Sunman, Quick, Mutz, Ragan, Meredith, Barns, O'Neal, Kirkpatrick and Custer.

Mr. Ragan, from Committee to whom was referred his resolution in relation to foreign immigration, presented the following, which was adopted:

WHEREAS, There is now pending a bill before the General Assembly of the State of Indiana to encourage foreign immigration to our State by securing to aliens the right to hold titles to real estate; therefore, be it

Resolved, That this Board earnestly recommends the passage of the bill above referred to, and that we heartily commend the present effort of citizens to encourage the immigration of farmers from Scotland and other foreign countries.

Mr. Mitchell, from the Committee on resolutions relating to the decease of Thos. V. Mitchell, reported as follows:

WHEREAS, The inscrutable hand of Providence has again invaded our ranks.

WHEREAS, Our late fellow-associate, Thomas V. Mitchell, has been called to cross the dark valley; therefore be it

Resolved, That in the demise of Mr. Mitchell the cause of Agriculture has lost an active and valued member, society a true man, the State a good citizen, and his family a kind and indulgent father;

Resolved, That these resolutions be spread upon the record of the Board, and a copy of them sent to the family.

ROBERT MITCHELL,
S. R. QUICK,
W. H. RAGAN,
Committee.

Mr. Ragan, from the committee appointed to petition the Legislature for relief, reported as follows:

Your committee to whom was referred the matter ot legislative aid, respectfully report: Immediately after the adjournment of the Board in January, your committee prepared a bill, the substance of which was the appropriation by the General Assembly of $60,000, and the taking up of the bonds of the Board, in consideration of which the Board should deed the Fair Grounds to the State, the same to be held by the State for the uses and purposes of the Board until such time as they might be otherwise needed, and providing that the Board should maintain and keep up necessary improvements, free of cost to the State.

Preceding the introduction of this bill, the trustee of the State, Mr. Davis, holding the trust deed, made his report to the Governor, setting forth the condition of the trust he represented. From some unknown cause this report has not been transmitted to the General Assembly, a fact which has seriously embarrassed your committee, as in the absence of this report, that body can have no official knowledge of the condition of the trust held by the State, and the imminent danger of loss through delay.

Your committee secured the introduction of the bill in the House, but the copy placed in the hands of a Senator, has not yet seen the light.

The House bill is now pending, with a very uncertain fate, before the committee of Ways and Means.

Your committee has conversed with a number of Senators and Representatives, and almost without exception find a very friendly feeling toward the Board in its embarrassed condition, yet we have not been particularly encouraged to hope for the passage of the pending bill, or any bill of similar purport, mainly owing to the reputed fact of there being but a small balance, quite insufficient, remaining in the State Treasury after making the absolutely necessary appropriations. This feeling prevails to such an extent even with the very best friends of the Board, that without the aid of potent arguments, we must expect serious obstacles to success in this direction.

Immediately following the introduction of the bill, an uncertain and quite indefinite proposition looking to the purchase of the grounds by private parties came to our knowledge, and although somewhat suspicious that it might be only a ruse to divert the attention of the General Assembly from the importance of prompt action, and to defeat any legislation in our favor, we gave the matter proper attention, hoping, even at a sacrifice, to make a sale and relieve ourselves of the embarrassment without legislative assistance.

However desirable a private settlement of our own affairs might be, your committee have nothing tangible to report from the effort above referred to.

W. H. Ragan,
Alex. Heron,
J. A. Wildman,
Committee.

On motion of Mr. Mitchell, the report was received and the committee continued.

Members of the Indianapolis Florists Society being present, were afforded opportunity to present communication from their Secretary, Mr. Lewis, relating to premiums in Horticultural Department, which, on motion of Mr. Ragan, was referred to Committee on Premium List.

A communication from the State Dairyman's Association, relating to premiums on dairy products, was referred to the same committee.

By consent, all other communications relating to premiums were referred to that committee without further action.

Mr. Sunman, from the Committee of Conference, with the Woman's State Fair Association, submitted the following:

The Woman's Fair Association request—

First—An appropriation of $1,000 for paying premiums and current expenses.

Second—Two hundred dollars additional for permanent improvements, upright show cases, decorations, etc.

Third—That what moneys they earn by renting show cases, or by other means, may remain in their treasury.

Fourth—That whatever moneys remain unexpended of the appropriation, shall become a fund under control of the Association.

Fifth—That the Association be allowed to disburse all moneys appropriated to, or earned by it, except for payment of premiums.

Sixth—That it be allowed to issue the premium orders as well as make the entries in their department.

Seventh—That all work done and exhibited by women and not entered for premiums in other departments, shall be included in the woman's department.

Eighth—That the Association shall have complete control of the woman's department.

Ninth—That they shall select the Awarding Committees for the Woman's Department.

Tenth—That they be allowed to rent or sell space in the Woman's Department.

Eleventh—That their jurisdiction on all their points be clearly defined.

Twelfth—That the standing and authority of the President of the Association as Superintendent of the Woman's Department be clearly defined.

Your committee recommended the adoption of the first, second, fifth, seventh, and ninth sections of the request, and that all the other sections be referred to the full Board for consideration.

R. P. HAYNES,
L. B. CUSTER,
T. W. W. SUNMAN,
Committee.

The report was received, and on motion, adopted.

Section 3 was amended by substituting for the words "their Treasury" the words, General Treasury of the Board.

On motion of Mr. Mitchell, the fourth section was laid upon the table.

Mr. Ragan moved to adopt the sixth section, which, after some discussion, was withdrawn, and on motion of Mr. Mitchell, laid upon the table.

Section 8 was adopted on motion of Mr. Mitchell.

On motion of Mr. Mitchell, section 10 was laid upon the table.

On motion of Mr. Ragan, sections 11 and 12 were adopted.

Mr. Ragan moved to reconsider section 8 and to amend it by substituting Exhibition for Department.

Mr. Haynes moved to amend the amendment.

Mr. Mutz moved to lay both amendments on the table, which, after much discussion, was carried, and then on motion of Mr. Mutz, section 8 was adopted.

On motion of Mr. Ragan, the vote on sections 11 and 12 was reconsidered, and laid upon the table.

The Secretary then read the proposed agreement of the Disbursing Committee of the Woman's Association, which on motion of Mr. Ragan was adopted.

On motion of Mr. Quick the vote to adopt was reconsidered, and referred back to the Committee appointed to consult with the Woman's Association.

The Secretary read the report of the Committee appointed by the Delegate Board relating to the adulteration of food, which by consent was handed to Mr. O'Neal to present to the General Assembly.

Mr. Quick from the Committee of Conference with the Woman's Fair Association, reported and recommended that

Section 3 read as follows; "To pay from the amount appropriated the premiums in full, to meet all expenses pertaining especially to the Woman's Department. All other requests rejected," which on motion of Mr. Mitchell was concurred in.

On motion of Mr. Mutz the Disbursing Committee of the Woman's Fair Association consisting of Mesdames Haggart, A. M. Noe, M. M. Finch, F. A. Townsend and Miss Ida James was approved.

Gov. Jas. D. Williams having been for many years a member of the Board, it was decided to procure his portrait for the frontispiece to the annual report, and also a brief biography to publish in same.

Board adjourned until 9 o'clock to-morrow morning.

SECOND DAY.

MORNING SESSION.

WEDNESDAY, Feb. 9, 9 o'clock, A. M.

Board met President Lockhart in the chair. Members present were Messrs. Mitchell, Haynes, Hancock, Sunman, Quick, Mutz, Gilbert, Ragan, Barns, Kirkpatrick and Custer.

Minutes of yesterday's proceedings read and approved.

Mr. Ragan offered the following, which was adopted:

WHEREAS, it is with deep regret that the members of this Board learn of the serious illness of Hon. John Sutherland, the oldest and one of the most highly esteemed members, and also of our late fellow associate and venerable friend H. T. Sample; the former with friends in this City and the latter at his home in Lafayette.

Resolved, Therefore, that the sympathies of this Board are hereby tendered our afflicted friends, with the hope that they may, through the manifestations of God's good pleasure, be speedily restored to their former condition of health.

On motion of Mr. Mitchell the bill for expenses incurred by the representation at the Inter State Agricultural Convention at Springfield, Illinois, was referred to the Committee on finance.

President Lockhart announced the Standing Committees and Department Superintendents for the ensuing year.

COMMITTEES.

On Finance—Ragan, Mutz and Mitchell.
On Rules and Regulations—Meredith, Quick and Sutherland.
On Fair Grounds—Custer, Kirkpatrick and Sunman.
On Premium List—Barns, Gilbert and O'Neal.
On Unfinished Business—Hancock, Haynes and Seward.
On Geology and Natural History, etc.—Executive Committee.

DEPARTMENT SUPERINTENDENTS.

Horse Department—Robert Mitchell.
Cattle Department—S. R. Quick.
Hogs Department—L. B. Custer.
Sheep Department—H. C. Meredith.
Poultry Department—R. P. Haynes.
Agricultural Department—J. K. O'Neal.
Mechanical Department—Jacob Mutz, T. W. W. Sunman.
Carriages, Wagons and Furniture Department—T. M. Kirkpatrick.
Textile Fabrics Department—Woman's Board of Industry.
Horticultural Department—Joseph Gilbert.
Geology, Natural History, etc.—Prof. John Collett.
Power Hall and Engines—W. B. Seward.
Gates and Amphitheater—John P. Barns.
General Permits—W. H. Ragan.
Permits in Ladies' Department—Jacob Mutz.

On motion of Mr. Mitchell the time for nomination of trustees of Purdue University, was set at 3 o'clock p. m. to-day.

On motion of Mr. Ragan the report of the Committee on Rules and Regulations made at the January meeting, relating to prices of admission, was taken up, and on motion of Mr. Quick, amended by striking out all that portion of the report that relates to the sale of badges to space opposite the Amphitheater. The report as amended was adopted.

Adjourned until 2 o'clock P. M.

AFTERNOON SESSION.

TWO O'CLOCK, P. M.

Board met President Lockhart in the chair. Members present Mitchell, Haynes, Hancock, Sunman, Quick, Mutz, Gilbert, Ragan, Barns, O'Neal, Kirkpatrick and Custer.

On motion of Mr. Ragan, $10,000 was appropriated for premiums for State Fair of 1881. This sum to include appropriations heretofore made.

Mr. Ragan, from the Finance Committee, reported that the committee having examined the bill of J. A. Wildman, amounting to $17.00, and bill for expenses incurred by representation at Inter-State Convention, recommend that the same be allowed, which was agreed to unanimously.

The hour having arrived for the nomination of two Trustees, on part of the Board, for Purdue University, on motion of Mr. Mitchell, the Board proceeded to make such nominations.

Mr. Mitchell nominated Mr. John Sutherland.

Mr. Gilbert nominated W. H. Ragan. The latter gentleman having received a majority of the votes cast, was declared duly nominated: Mr. Mitchell nominated Mr. Mutz for the same. There being no other nomination, Mr. Mutz received the entire vote and declared duly nominated, whereupon the President announced that Mr. Ragan and Mr. Mutz were nominated by the Board of Trustees for Purdue University for the ensuing term.

On motion of Mr. Mitchell, the Secretary was instructed to transmit the action of the Board to the Governor at his earliest convenience.

By his request, Mr. Sunman was excused from further attendance at this meeting.

On motion of Mr. Mitchell, the Board resolved itself into committee of the whole on revision of the premium list. At 6 o'clock the committee rose, when President Lockhart resumed the chair and called the Board to order. Mr. Mitchell, from committee of the whole, reported progress and asked leave to sit again. Report received and leave granted.

On motion, the President and Secretary were appointed a committee of investigation, relating to expert committeemen making charges to exhibitors for writing up merits of exhibits for publication in the annual reports.

The Board then adjourned until 9 o'clock to-morrow morning.

THIRD DAY.

MORNING SESSION.

THURSDAY, Feb. 10, 9 o'clock A. M.

Board met. President Lockhart in the chair. Members present, Messrs. Mitchell, Haynes, Hancock, Quick, Mutz, Gilbert, Ragan, Barns, Kirkpatrick and Custer.

Minutes of yesterday's proceedings read and approved.

Mr. Lockhart, from the committee to investigate the matter of charges by expert committeemen to exhibitors for the purposes mentioned yesterday, made verbal report that exhibitors had paid expert committeemen for such reports, but that this practice is most emphatically condemned by this Board,, as such committeemen are paid by the Board to make impartial reports. The report was accepted.

Mr. Ragan moved that his resolution offered in 1879, as follows, be adopted:

Resolved, That it shall be the settled purpose and aim of the State Board of Agriculture to sell the present Fair Grounds at the very earliest day compatible with the best interests thereof; to pay off the present indebtedness, and to relocate on some more eligible grounds situated on some of the numerous lines of railroads near this city, and accessible therefrom.

Resolved, That the Executive Committee of the Board shall be instructed to receive bids, private or otherwise, for the present Fair Grounds; and in the event of receiving a bid that shall appear to the judgment of the committee to be as a favorable one, that then the committee shall be empowered to convene the Board in extra session, to consider, and if thought best, to confirm the sale, which was agreed to.

The Board then resolved itself into committee of the whole to continue the revision of the premium list.

At 12 o'clock the committee rose, President Lockhart resumed the chair and called the Board to order.

Mr. Mitchell, from the committee, reported progress and asked leave to sit again, which was granted.

The Board then adjourned until 2 o'clock P. M.

AFTERNOON SESSION.

TWO O'CLOCK P. M.

Board met, President Lockhart in the chair. Members present: Messrs. Mitchell, Haynes, Hancock, Quick, Mutz, Gilbert, Ragan, Barns, O'Neal, Kirkpatrick and Custer.

The Board then resolved itself into committee of the whole to continue revision of the premium list.

At 4 o'clock the committee rose, President Lockhart resumed the chair and called the Board to order.

Mr. Mitchell, from the committee of the whole, reported that the committee had completed its labors, as will be seen by the printed premium list, and asked to be discharged.

On motion the report was received and the committee discharged.

Mr. Mutz offered the following:

WHEREAS, The Woman's State Fair Association earned in 1880 the sum of $16 by the renting of show-cases in the woman's department; therefore be it

Resolved, That the Woman's Association are entitled to that sum in addition to the regular appropriation, to use for the prosecution of their general State work.

Adopted.

On motion of Mr. Ragan, the proposition from the Florists' Society was referred to the Executive Committee.

Mr. Ragan moved that $500 be appropriated to meet expenses in the Floral Department. Carried.

By request of Mr. Gilbert, Mr. Foote of Terre Haute, was granted leave to exhibit his display.

On motion of Mr. Gilbert, the Executive Committee was authorized to employ a competent person to solicit *special* premiums from manufacturers and others of Indianapolis and throughout the State.

On motion of Mr. Ragan, all unfinished business was referred to the Executive Committee.

On motion of Mr. Haynes, Awarding Committeemen were apportioned to each member the same as last year, the newly elected members taking the place of the retiring members, which is as follows:

On Horses—Messrs. Haynes, Gilbert, Meredith, O'Neal and Kirkpatrick, one each.

On Jacks and Mules—Messrs. Mutz, Gilbert and Sutherland, one each.

On Cattle—Messrs. Mitchell, Hancock, Quick, Mutzs, Barns and Kirkpatrick, one each.

On Sheep—Messrs. Hancock, Sunman, Meredith, Barns, Custer and Sutherland, one each.

On Hogs—Messrs. Mitchell, Haynes, Sunman, Meredith, O'Neal and Custer, one each.

On Agricultural Department—Messrs. Custer, Lockhart and Sutherland, one each.

The President allotted Gate-keepers for 1881 as follows: Messrs. Mitchell, Quick, Mutz, Barns, Custer and Ragan, one each.

The Board then adjourned to meet at the Fair Grounds, Monday, September 26, at 10 o'clock A. M.

EXECUTIVE COMMITTEE MEETINGS.

FEBRUARY SESSION.

AGRICULTURAL ROOMS,
February 22, 1881.

The Executive Committee met agreeably to call. Present Messrs Lockhart ex-officio Chairman, Mitchell, Mutz, Ragan and Quick; also Mr. Barnes of the special Legislative Committee.

The Secretary laid before the Committee such matters as had been presented and referred to the Executive Committee.

Ordered, That all appropriate special premiums offered be accepted and included in the premium list.

Ordered, That the Secretary be authorized to furnish the premium lists for the State Fair. The usual number with advertisements.

Ordered, On motion of Mr. Ragan, that a silver medal be offered for best general display of goods in each of the several non-premium or mechanical classes.

Ordered, On suggestion of Mr. Beeler, that in case the State Pioneer Association conclude to hold a reunion at this city during the State Fair, all Pioneers 70 years of age, and resident in the State forty years, be admitted to the Fair free.

Adjourned.

Owing to the facts that consent to use Purdue University farm for a field trial, was not obtained in season to perfect arrangements, and added to this, serious illness of the President and Secretary at the time that preparation should have been made, the Committee concluded to abandon the attempt to hold such trial as proposed.

MAY SESSION.

May 24, 1881.

Agreeably to call of the President, the Executive Committee met in the Secretary's office. Present: Messrs. Mitchell ,Mutz, Ragan and Quick.

Ordered, On motion of Mr. Mutz, that the two and three-quarter acres of ground owned by the Board, situate near the Fair Ground, be placed in the market at a minimum price of $6,000.

Ordered, That no exclusive privileges be granted on the Fair Grounds. This in answer to several propositions for such.

Ordered, On motion of Mr. Ragan, that the Treasurer and Secretary be and are hereby authorized and instructed to sell the government bonds now held by the Board, and apply the proceeds thereof, together with an additional sum to be drawn from the treasury, sufficient to liquidate $10,000, with accrued interest thereon, of the present outstanding bonds of the Indiana State Board of Agriculture.

Ordered, On motion of Mr. Quick, that the Woman's Fair Association be granted the use of the partitions in the Fine Art Department on second floor: *Provided*, That it does not exclude legitimate exhibitors therein.

The Secretary submitted a communication for publication in *Indiana Farmer*, relating to the advance in admission fees at the State Fair, which was endorsed by the Committee, and is as follows:

STATE FAIR ADMISSION FEES.

Editors Indiana Farmer:

The objections made to the advance in the rates of admission to the coming State Fair by "P. W. C.," in a recent issue of the *Farmer*, are well timed, and to-those not understanding the reasons for the advance, it may seem as arbitrary on the part of the Board. Hence we are rather pleased with the opportunity, at this early day in the season, to give some facts in the case and "the reason why" the advance in price of admission was made, believing that "P. W. C." is consistent in his views, and would have favored the measure were he a member of the Board and knowing the facts. The subject was before the Delegate Board at the January meeting, 1880, and warmly discussed. The arguments are published in full in the Annual Reports for 1879, beginning at page 85. Again, in January last the subject was before the delegates, and recommended after discussion by Dr. Stevenson, Putnam county; Arch. Johnson, Montgomery county; Jacob Mutz, Shelby county; W. B. Seward, Monroe county; L. B. Custer, Cass county; J. McDonald, Lagrange county; J. C. Campbell, Henry county; Fielding Beeler, Marion county; H. S. Byers, Johnson county; L. T. Hardin, Laporte county; John Ratliff, Grant county; and M. R. Elliott, Henry county, as the records show. In fact, the arguments were all in favor of the advance, and only slight doubts were expressed as to the policy of the change. There was not a dissenting voice on the adoption of the measure in the meeting where fifty-six of the county, sixteen of the district societies, and ten of the State industrial associations were represented. The discussion is published in full in the forthcoming Indiana Agricultural Report, beginning on page 108, so it seems useless to repeat the arguments here, except in a brief manner.

In order to sustain existence at the twenty-five cents admission fee, the premiums on live stock had been reduced until they would not bear any comparison with those at adjoining State Fairs, and the premiums in the mechanical department were abolished entirely. With the improvement in the affairs of the country and bright prospects for the future, an increase of the premiums seemed indispensable, and to meet this increase there was no alternative but to raise the money by increase of gate fees. Experience had demonstrated about how much of an attendance can be relied on, and we could not expect a larger gathering than was present at the last fair, of which the reports show, that after the closest economy in expense, there was not surplus enough left to put the grounds and buildings in the order they should be for the next fair, to say nothing of paying the interest on the debt generously paid out of the State Treasury. We have yet to hear of a single reason why Indiana should be expected to run a first-class State Fair for half 'the price of admission charged by any other State.

The great mistake of the Board was in 1873 in attempting to run the Exposition and State Fair at an immense expense, for a half rate admission, as charged by other exhibitions of a similar character. Had they inaugurated the fifty cents admission then, the Board would not have been in the position of beggars at each session of the Legislature since. Here in Indianapolis there have repeatedly been hundreds turned away from the circus tent, their fifty cents refused, as the canvas was full. An ordinary minstrel show demands fifty cents at the door, and surely no one would compare the exhibition at a State Fair as of less value.

At the January meeting of 1880, Mr. Ragan, as a member of the Board, and Mr. Beeler as a delegate, made speeches against any advance in price of admission. After his experience as President one year, Mr. Ragan in his address at the Janu-

ary meeting, 1881, urged the advance, and Mr. Beeler having served as general Superintendent the past year, has changed his views, and to any one doubting the propriety of the action of the Board, we request that they read the discussion on the subject in the published report of the Board.

ALEX. HERON, Secretary.

Adjourned until 8:30 A. M. to-morrow.

SECOND DAY.

WEDNESDAY, May 25, 1881.

Committee met, present Messrs. Mitchell, Ragan and Quick.

Ordered, That the proposals for amusements at the State Fair be left to the discretion of the officers of the Board.

Ordered, On motion of Mr. Ragan, that the dining hall, known as the old music hall, be used as the Horticultural Hall (especially for flowers) at the next State Fair.

At this meeting considerable discussion was had in reference to the bonded debt of the Board, which was now overdue, and various suggestions made as to the best manner of meeting it. Conferences were had with Mr. Hambleton, one of the holders, and representing other holders of the bonds, all of which resulted in no decisive action. Some discussion was also had in relation to a claim of the C. C. C. & I R. R., but no definite arrangements was reached.

The committee then adjourned to meet on call of the President.

JUNE MEETING.

AGRICULTURAL ROOMS,
TUESDAY, June 28, 1881.

Committee met pursuant to call. Present, Messrs. Mitchell, Mutz, Ragan and Quick. This day was spent in considering various proposals of loans to the Board, and the communication from the C. C. C. & I. R. R. Co., concerning its claim on the Fair Grounds, and the committee adjourned until 9 o'clock to-morrow morning.

SECOND DAY.

WEDNESDAY MORNING, 9 o'clock.

Committee met. Present, Messrs. Mitchell, Mutz, Ragan and Quick, and Mr. Barnes of the Board.

Mr. Ragan offered the following resolution, which was adopted:

Resolved, That the Executive Officers of the State Board of Agriculture be, and are hereby authorized, to issue fifty-five (55) new bonds of the denomination of one thousand ($1000) dollars each, and bearing interest at the rate of six (6) per cent. per annum, payable semi-annually; advertising and placing the same on sale; taking up and canceling a like number of the present outstanding bonds, and making the necessary transfers, etc., under the provisions of an act of the General Assembly, approved April 14, 1881. Also that the sum of five thousand ($5000) dollars is hereby appropriated from the treasury, with which said Executive Officers shall take up and cancel the remaining five thousand ($5000) dollars of the bonded debt of the State Board of Agriculture.

Any previous action of the Board in conflict with the foregoing is hereby repealed.

Ordered, That Messrs. W. H. English, William S. Hubbard and John Caven be appointed as appraisers to value the ground mortgaged, to secure the bond-holders as ordered by the foregoing resolution.

Ordered, On motion of Mr. Mutz, that Mr. Ragan be appointed as Supervisor of the spacing for exhibitions in the Exposition building, at $3.00 per day.

Also that Mr. Beeler assist in soliciting exhibits.

The committee then adjourned.

In accordance with the resolution of Mr. Ragan, adopted at the 29th of June meeting, advertisement was made in the Indianapolis Journal and Sentinel for ten days.

On July 15, 1881, the Executive officers met in the Secretary's office at 9 o'clock A. M., to consider the propositions that had been offered, and to place the loan as per said resolution.

Those present were President Lockhart, Secretary Heron, General Superintendent Beeler, and Messrs. Mitchell and Ragan of the Executive Committee.

Mr. Hubbard not being found, Mr. Ingram Fletcher was substituted in his place, and the appraisers, Messrs. English, Caven and Fletcher, after careful survey of the premises, appraised the State Fair Grounds at $110,000, and the improvements at $40,000.

After full consideration of the several propositions to place the loan, that of John A. Hambleton & Co., of Baltimore, Maryland, was accepted, and instead of issuing new bonds, the original bonds were continued by printing in red ink on the face thereof the following:

> "At the request of, and for value received by the owner of this bond, the same is continued with all its liens and securities for five years, with privilege of ten years, to bear interest at the rate of 6 per cent. per annum from July 15, 1881. Interest payable semi-annually on the 15th of January and July of each year, at the banking house of John A. Hambleton & Co., Baltimore, Md."

Five thousand two hundred ($5200) dollars was also placed to the credit of Messrs. Hambleton & Co. in the Indiana Banking Co. to redeem the five remaining bonds and to pay interest on the whole amount to July 15, 1881.

STATE BOARD MEETINGS

DURING THE FAIR.

FIRST DAY.

EXPOSITION BUILDING, FAIR GROUNDS,
MONDAY, Sept. 26, 10 o'clock A. M.

Board met agreeably to adjournment. Vice President Hancock took the chair in absence of the President. On call of the roll, Messrs. Mitchell, Hancock, Barns and Custer answered to their names. There being no quorum present, adjourned to meet at 3:30 o'clock P. M.

AFTERNOON SESSION.

3:30 O'CLOCK P. M.

Board met. President Lockhart in the chair. All the members present except Messrs. Meredith and Sutherland.

The minutes of meetings from Feb. 10 to date were read and approved.

On motion of Mr. Mitchell, it was decided that the races set for to-day shall take place to-morrow, provided they have been properly filled according to program.

On motion of Mr. O'Neal, it was agreed that the Board meet promptly at 8 o'clock to-morrow morning to select committees in the various classes. It was also ordered that children under eight years of age be admitted free.

On motion of Mr. O'Neal, the President was authorized and requested to instruct the general Superintendent to have the sheds, tents and awnings now around the headquarters—the same being a nuisance—removed immediately.

Adjourned until 8 o'clock to-morrow morning.

SECOND DAY.

MORNING SESSION.

TUESDAY, SEPT. 27, 8:30 O'CLOCK.

Board met. President Lockhart in the chair. A quorum being present, the minutes of yesterday's proceedings were read and approved.

On motion of Mr. Haynes, Mr. Seward was authorized to select the Awarding Committee on books A, B, C and D, and superintend the same.

It was also ordered that the Awarding Committee on book E be selected by Messrs. Sunman and Mutz, and that Dr. R. T. Brown be attached to said committee. Also that Mr. Kirkpatrick select the Awarding Committee on books F and G, and that Messrs. Hancock, Sutherland and Ragan select the Awarding Committee for books H. and I.

Mr. J. Q. A. Sieg was selected as an expert judge on Jersey cattle, the cattle committee being composed of Messrs. Dick Jones, Columbus; James W. Kay, Fredricksburg; Jacob L. Saylors, Wabash, and Peter Taylor, Boonville.

Messrs. Gilbert and Ragan were authorized to select Awarding Committee in the Horticultural Department.

The Board then took a recess until 2 o'clock.

AFTERNOON SESSION.

TWO O'CLOCK, P. M.

Board met President Lockhart in the chair. A quorum present.

On motion of Mr. Meredith it was agreed that the Superintendent of the Horse Department should have full discretion as to issuing tickets of admission to exhibitors and their assistants in this department.

After some discussion in regard to issuing pass tickets to exhibitors and their assistants in other departments, it was agreed that all the Superintendents of Departments should have entire control thereof, drawing upon Mr. Ragan, Superintendent of permits for the same as may be required.

On motion of Mr. Quick, the General Superintendent was instructed to have the obstruction at the south-east corner of Headquarters building removed this evening, by force if necessary.

Adjourned until 8 o'clock A. M. to-morrow.

THIRD DAY.

MORNING SESSION.

WEDNESDAY, SEPT. 28, 1881, 8 O'CLOCK, A. M.

Board met, President Lockhart in the chair. Quorum present.

Mr. Hancock moved that Mr. Mitchell, Superintendent of Horse Department be allowed to carry the purse offered for the running race on Monday to a green pacing race to-day. Carried.

On motion of Mr. Sutherland, Mr. Mitchell was authorized to use full discretion in regard to purses etc., in the speed ring to-day. The Board then took a recess until 2 o'clock P. M.

AFTERNOON SESSION.

TWO O'CLOCK, P. M.

Board met and confirmed the selection of awarding committeemen, as follows:

On Books A, B, C and D.—Gustavus Zscheck and Samuel Goldsberry.

On Book E.—R. T. Brown and ———Tomlinson.

On Book F.—I. N. Pattison and S. M. White.

On Book G.—David Hazzard and W. A. Sturgeon.

On Cattle.—J. L. Saylors, Wabash; J. Q. A. Sieg, Corydon; Dick Jones, Columbus; Peter Taylor, Boonville; James W. Kay, Fredricksburg; Smith Wooters, Billingsville.

On Sheep.—James M. Morrow, Adams; J. Q. A. Sieg, Corydon; Moses Butterworth, Laporte; Jas. Hollingsworth, Anderson; Homer B. Waddus, Connersville; Hud. McKee, Logansport.

On Heavy Draft Horses.—Col. N. P. Richmond, Kokomo; D. B. Woodcock, Lafayette, R. C. McWilliams, Rockville; A. L. Powell, Newcastle.

On Agricultural Products.—J. C. Custer, Cass County; Esquire Wells, Shelby County; C. Fitch, Laporte County.

On motion of Mr. O'Neal it was ordered that the Exposition building be kept open Thursday evening, and the admission fixed at twenty-five cents.

On motion of Mr. Haynes it was agreed that in case the race for the Consolation purse for runners be not filled to-morrow, Mr. Mitchell be empowered to get up a trotting race for a purse not to exceed $100, whereupon the Board took a recess until 8 o'clock A. M. to-morrow.

FOURTH DAY.

MORNING SESSION.

THURSDAY, SEPT. 29, 8 O'CLOCK.

Board met. There being no special business. Recess until 2 P. M.

AFTERNOON SESSION.

TWO O'CLOCK, P. M.

Board met. A protest was presented by H. C. Burleigh against the award of the judges on sweepstakes on Bulls, and asking the appointment of a new awarding committee.

The matter was considered and on motion of Mr. Haynes the action of the committee was sustained.

Other protests were presented by D. L. Thomas, Allen Jackson, H. O. Thudium and M. C. Stewart, the consideration of which were deferred until to-morrow.

On motion, the President appointed Messrs. Gilbert, Haynes and Ragan a Committee to confer with the florists and audit accounts.

On motion of Mr. Meredith, the time for making entries in the free for all trotting race was extended until 6 o'clock P. M. to-day.

On motion of Mr. Gilbert, the entries for the bicycle race were considered sufficient and the race was ordered.

The following Committees on hogs were announced:

Berkshires—J. C. Robinson, Decatur Co.; W. A. Macy, Lewisville; W. R. Parkison, Pleasant Grove.

Poland China—L. F. Harding, Laporte; J. W. Potter, Ladoga; D. H. Youman, Rensselaer.

Sweepstakes on Hogs—Peter Taylor, Boonville; Thos. Huey, Clinton; Samuel Snell, Walton, Cass Co.

Adjourned until 8 o'clock A. M. to-morrow.

FIFTH DAY.

MORNING SESSION.

FRIDAY, SEPT. 30, 8 O'CLOCK.

Board met, President Lockhart in the chair. A quorum being present, the minutes of the several meetings since the 26th inst. were read and approved.

The President called attention to the several protests, consideration of which had been deferred until this morning.

The protest of D. L. Thomas against the award on mares four years and over, colt at side, Book 3, Light Harness, was taken up. He did not show his mare to harness, believing that it should not be required to so show brood mares, and thought that this caused his mare to lose the premium, hence his protest.

On motion of Mr. Haynes, the award by the Committee was sustained.

The protest of Allen Jackson against the award to three years old mare, Light Harness, on the ground that she had been shown in previous classes, was taken up. Investigation showing that she was entitled to be so shown, on motion of Mr. Meredith, the Superintendent was sustained in his decision and the action of the Committee sustained.

The protest of Churchman & Jackson against the award to W. J. Hasselman in the "Herd Prize," Book 2, on the ground that the cow with calf at foot, which constituted part of the herd, had previously been exhibited for another premium, was taken up.

On motion of Mr. O'Neal the award was sustained.

The protest of H. O. Thudium against the award to rustic stand "filled," on the ground that the plants were in *pots* arranged to fill the stand, was not sustained. The award was confirmed.

In the matter of protest by Miss M. C. Stewart against the award on collection of plants for the Gardner prize, it was ascertained that the fault, if any, was in not having the boundaries of her collection properly defined.

Discussion as to age of lambs in the item "Buck and five best lambs," developed the sense of the Board that the lambs referred to must be of the lambing of 1881.

Recess taken until 2 o'clock P. M.

AFTERNOON SESSION.

TWO O'CLOCK, P. M.

Board met, President Lockhart in the chair.

On motion of Mr. Sutherland, the Secretary was instructed to commence issuing premium orders for the payment of premiums.

On motion of Mr. Mutz, it was agreed that each Superintendent of Department shall ascertain as nearly as practicable the amount to be paid Committeemen in said Department and draw from the Treasury the money to pay the same.

It was ordered that each Superintendent of Department shall call upon the General Superintendent, whose duty it shall be to accompany the Superintendent and collect any stall rent due from exhibitors before leaving the grounds.

Adjourned until 9 o'clock A. M. to-morrow.

SIXTH DAY.

MORNING SESSION.

SATURDAY, OCT. 1, 9 O'CLOCK.

Board met, President Lockhart in the chair. All members present except Messrs. Hancock, Sutherland and Seward.

Minutes of previous meetings read to date and approved.

After some discussion relating to the awards in the Poultry Department, on motion of Mr. Mitchell, they were approved.

On motion of Mr. Haynes, the pay to Assistant Superintendent in the Horse Department, was fixed same as last year.

On motion of Mr. Mitchell, it was ordered, that bills ordered by Department Superintendents for services of assistants be paid.

On motion of Mr. Meredith, the General Superintendent was instructed and authorized to employ, at his earliest convenience, a suitable person to take charge of the Exposition building and grounds, whose compensation shall not exceed $365 per annum.

Mr. Mutz offered the following:

Resolved, That the thanks of the Board be tendered to the ladies of the Woman's Fair Association, for their able and efficient management of the Woman's Department.

Which was unanimously adopted.

On motion of Mr. Ragan, all unfinished business was referred to the Executive Committee.

On motion of Mr. Mutz, adjourned to annual meeting, 1882.

ANNUAL MEETING, 1882.

Agricultural Rooms,
Tuesday, Jan. 3, 1882, 10:30 a. m.

Agreeably to law, the Delegate State Board of Agriculture met in annual convention, President Lockhart in the chair.

The roll of the State Board proper was first called, when the following members responded:

1st Dist.—Robert Mitchell, Princeton, Gibson county.
2d Dist.—R. P. Haynes, Montgomery, Daviess county.
3d Dist.—B. H. Hancock, Fredricksburg, Washington county.
4th Dist.—W. B. Seward, Bloomington, Monroe county.
5th Dist.—T. W. W. Sunman, Spades, Ripley county.
6th Dist.—S. R. Quick, Columbus, Bartholomew county.
7th Dist.—Jacob Mutz, Edinburg, Johnson county.
8th Dist.—Joseph Gilbert, Terre Haute, Vigo county.
9th Dist.—W. H. Ragan, Clayton, Hendricks county.
10th Dist.—Henry C. Meredith, Cambridge City, Wayne county.
11th Dist.—John P. Barns, Anderson, Madison county.
12th Dist.—J. K. O'Neal, Lafayette, Tippecanoe county.
13th Dist.—T. M. Kirkpatrick, Kokomo, Howard county.
14th Dist.—L. B. Custer, Logansport, Cass county.
15th Dist.—John Sutherland, Laporte, Laporte county.
16th Dist.—R. M. Lockhart, Waterloo, De Kalb county.

Following which the roll of counties in the State was called, for delegates from county societies, when the following named gentlemen responded:

COUNTY SOCIETIES.

COUNTIES.	DELEGATE.	POST OFFICE.
Bartholomew	J. L. Jones	Taylorsville.
Blackford.	Theo. P. VanWinkle	Hartford City.
Boone	John Higgins	Thorntown.
Cass	George Zim	Logansport.
Clarke	D. F. Wiley	Charlestown.
Clay	A. J. Montgomery	Brazil.
Daviess.	R. P. Haynes	Montgomery.
Decatur	W. W. Hamilton.	Greensburgh.
Delaware	T. W. Tuttle	Muncie.
Fulton	Vernon Gould	Rochester.
Gibson	Jasper Davidson	Hazleton.
Grant	John Ratliff	Marion.
Hamilton.	S. M. Smith	Eagletown.
Harrison	David Jordan	Corydon.
Howard	T. M. Kirkpatrick	Kokomo.
Huntington	J. G. Amiss	Huntington.
Jackson	John Scott.	Brownstown.
Jay	John Schmuck	Portland.
Jefferson	W. P. Graham	Madison.
Johnson	H. S. Byers	Franklin.
Knox	H. A. Foulks	Vincennes.
Lagrange	John McDonald	White Pigeon, Mich.
Lake	J. P. Spaulding	West Creek.
Laporte	John Sutherland	Laporte.
Lawrence	Wm. Day	Bedford.
Madison	C. K. McCullough	Anderson.
Marion.	Sylvester Johnson	Irvington.
Montgomery	J. N. Davidson.	Whitesville.
Morgan	L. Sims	Martinsville.
Noble	W. W. Latta.	Ligonier.
Parke	James A. Allen	Rockville.
Pike	Samuel Hargrove	Union.
Randolph.	D. E. Hoffman.	Winchester.
Rush.	Elisha King	Rushville.
Shelby	John Blessing	Shelbyville.
St. Joseph	Aaron Jones	South Bend.
Steuben.	A. W. Hendry	Angola.
Tippecanoe	J. K. O'Neal.	Lafayette.
Tipton	W. A. Maze	Sharpsville.
Vigo	U. R. Jeffers	Terre Haute.
Wabash	Warren Mason.	Wabash.
Warren	James Goodwin	West Lebanon.
Warrick	W. L. Mellin	Boonville.
Washington.	B. H. Hancock.	Fredricksburg.

DISTRICT SOCIETIES.

District.	Delegate.	Post Office.
Bridgeton Union	Dempsey Seybold	Perth, Clay County.
Cambridge City	H. C. Meredith	Cambridge City.
Fountain, Warren and Vermillion	Oliver Shelby	Covington.
Northeastern Indiana	James N. Chamberlain	Waterloo.
Russelville Union	J. N. Fullenweider	Brown's Valley.
Knightstown Union	John B. Hearkless	Knightstown.
Edinburg Union	George W. King	Edinburg.
Loogootee District	Henry J. Johnson	Loogootee.
New Ross Agr'l Society	John Lockridge	Mace.
Lawrence Tp., Marion Co. Agricultural	W. B. Flick	Lawrence.

STATE INDUSTRIAL ASSOCIATIONS.

Associations.	Names.	Post Office.
Woman's State Fair Ass'n.	Mrs. M. E. Haggart	Indianapolis.
State Horticultural Society	Dr. Allen Furnas	Danville.
Purdue University	Prof. C. L. Ingersoll	Lafayette.
Dairyman's Association	Sylvester Johnson	Irvington.
Short Horn Breeders	Thomas Nelson	Bloomingdale.
Swine Breeders	A. S. Gilmore	Greensburg.
Wool Growers	Fielding Beeler	Indianapolis.
Bee Keepers	F. L. Dougherty	Indianapolis.

As there was no response from many counties and district societies, and as it was reported by many delegates that some county and district societies that had heretofore sent delegates, had disbanded or otherwise failed to manifest existence; on motion of Dr. J. N. Chamberlain, it was agreed that all societies that have not elected officers and reported to the Secretary of the State Board for three years last past, shall be dropped from the roll.

On motion of Mr. Beeler, Messrs. Mitchell, McDonald and Blessing were appointed a Committee on Credentials.

The following was announced as the order of business for the meeting:

TUESDAY, JANUARY 3, 1882.

Organization of the Convention at 10:30 A. M.

President's address at 1:30 P. M., followed by reports from the officers, department superintendents and President of the Woman's State Fair Association.

Appointment of joint committees of delegates and members. Nominations to fill places of retiring members.

Address by Governor Porter at 3:30 P. M.

EVENING SESSION—7:30 P. M.

Address by Prof. John L. Campbell, of Wabash College, on "The Topography of Indiana."

WEDNESDAY, JANUARY 4.

Reports from committees: Finance, Rules, etc., Fair Grounds, Premium List, Geology, and unfinished business. Review of business matters.

Election of eight members at 1:30 P. M.

Address by George L. Curtis, M. D. on "Air Dust; What Is It and its Effect on Man and Beast," 3 P. M.

EVENING SESSION—7:30 P. M.

Address by F. A. Friedley, D. D., President of DePauw College, New Albany, on "Education Necessary to Successful Farming."

The following carefully prepared papers will be presented, subject to the pleasure of the Convention, as time will permit:

"Our Agricultural College Work," by Prof. C. L. Ingersoll, of Purdue University; "Indiana Inducements for Immigrants," by Dr. A. C. Stevenson, of Putnam county; "Importance of Statistics to the Agricultural Interests," by Hon. J. B. Conner, Chief of the Bureau; "Fencing of the Future," by Hon. R. M. Lockhart, of DeKalb county; "Laws Restricting Live Stock," by L. B. Custer, of Cass county; "The Cultivation of Walnut Timber," by Hon. W. H. Ragan, of Hendricks county; "Sheep Husbandry in Indiana," by Capt. H. C. Meredith, of Wayne county; "Fish Culture," by Calvin Fletcher, Commissioner of Fisheries; "Home Agricultural Education," by Dr. R. T. Brown, of Marion county.

Other appropriate essays are expected. General remarks and discussion will be in order and follow each address or essay.

The Board then adjourned until 1:30 o'clock P. M.

AFTERNOON SESSION.

Board met at 1:30 P. M.

Vice President Hancock was called to the chair.

PRESIDENT LOCKHART'S ADDRESS.

Gentlemen of the Delegate and State Board of Agriculture:

Complying with the usual custom of those elected to the honorable position which I now occupy as President of the State Board of Agriculture, it becomes my duty to briefly review the work of the Board for the past year, and to make to this honorable body such suggestions for the future as I may think of sufficient importance to require your attention.

Before entering upon this work I wish to extend to this Delegate Board a hearty greeting. Never before since my connection with the Board have I seen so much interest manifested in its work, and the fact that so many business men of the city and leading Agriculturists and Manufacturers are here with us to-day shows conclusively that our work is being appreciated more fully from year to year.

While we are here to-day in the full enjoyment of life and health let us not forget that some of our comrades have fallen by the way.

Since our last Annual Meeting two of our former members, who were with us on that occasion in seeming good health, have passed off the stage of action.

We will not soon forget the familiar countenances of Father Sample and Thomas V. Mitchell. You will see to it, gentlemen, that committees be appointed to consider and appropriately remember those departed members. To those of you that have been with us as Delegates in former years the discussions on the financial condition of our State Board was anything but a pleasing feature. We are most happy in being able to say to you at this early moment in the work of this Annual Meeting that we shall not find it necessary to occupy your valuable time in discussing such an unpleasant state of affairs as existed when we last met in this capacity. With many thanks to our most excellent Governor who stood by us so nobly, and the hearty co-operation of leading members of both branches of the Legislature, we secured the passage of an act by which we were enabled to refund the loan on our grounds and buildings for five years, with the privilege of ten years at a much lower rate of interest. The Board paid off five of the original bonds out of money earned by the holding of Fairs. Instead of a bonded debt of sixty thousand dollars, bearing 8 per cent. interest one year ago, there is now but fifty-five bearing 6 per cent. interest, making a saving of $1,500 annually on the interest account. The Secretary and Treasurer will present to you a full and complete report of all moneys received and paid out by the Board during the year, which I hope will be found very satisfactory to this Delegate Board.

As will be remembered the Delegate Board at their last meeting, recommended that the price of admission to the State Fair be advanced from 25 to 50 cents.

Acting on this recommendation the Board at the February meeting in making up its premium list added a large per centage to the premiums to be awarded at the State Fair of 1881, to correspond with the advance in price of admission. The Board was very severely criticised for this action by the city press and also by many of the county papers.

A great failure was predicted and many men, from whom better things were expected, joined in the cry of failure. The Board has no doubt that many remained at home that would have attended the Fair, had they not been led to believe that the fair certainly would not be a success.

Realizing the fact from past experience that a successful Fair could not be held at the old rate of admission (25 cents,) we decided not to yield the position we had taken and the result of the Fair showed that we were not mistaken. There never was a more successful Fair held on the grounds than the Fair of 1881. The Press of the city with a few exceptions soon discovered this fact and showed their good sense in admitting it, and gave the Board the honor of having a success when nothing but failure had been predicted.

In January last a meeting was held in the city of Toledo, for the purpose of organizing a Fair Circuit. The object of which was to so arrange the time of holding the principal fairs of Ohio, Michigan and Indiana, that they should not come in conflict with each other; and also give better facilities of advertising the different Fairs. This arrangement was brought about mainly by the efforts of President Bomgardner and Secretary Farley of the Tri-State Fair, held at Toledo. The Fairs composing this Circuit are the Ohio State Fair; Northern Ohio, at Cleveland; Tri-State Fair, Toledo; Michigan State Fair; Indiana State Fair, and Northeastern Indiana, at Waterloo, making a continuous circuit lasting six weeks. The result of this arrangement was very gratifying to all connected with the Circuit. It enables manufacturers to arrange a line of goods to be shown at all of these Fairs by one set of competent agents; and also gives them the advantage of half-fare rates in making the Circuit. Stock men are also accommodated in the same manner. I would advise the appointment of delegates to the meeting to be held at Detroit, January 10th, to take steps for the continuation of the Circuit for another year.

By the act of the Legislature, approved February 14th, 1851, creating the State Board of Agriculture, there was no special limits provided that each member should represent. There were sixteen members chosen from different parts of the State, one-half to serve for one year, and one-half for two years. Each year thereafter eight members were elected to fill vacancies. These were selected without respect to locality. At the annual meeting of 1859, action was taken by which the State was divided into sixteen agricultural districts, from which eight members were to be elected each alternate year. An examination of our State maps showing the boundary lines of the districts as they now stand, will show to all fair minded men that the division as then made is not a fair one, according to the present population of the State. Take, for instance, the First District, now represented by Mr. Robert Mitchell, and the Sixteenth, represented by myself, you will find the Sixteenth has more than double the population of the First. Other districts will bear a like comparison. If I made claim that my ability to represent the people was more than twice that of my friend Mitchell, I think my claim would not be sustained.

I think that one of the duties of this annual meeting should be the appointment of a Committee of, say, five men; two from the State Board and three from the Delegate Board, to immediately consider this matter and to so district the State that all parts of it may be equally represented. I have looked over the matter carefully, and know that this can be done without materially affecting the Districts as they are now constituted, with one exception—the Seventh District. The population of the County of Marion is now far in excess of some of the Districts as now constituted.

There are many and very great reasons why this County should alone comprise one of the sixteen Districts. I will ask your indulgence for a short time while I briefly review a few of the reasons why I think this should be the case.

Indianapolis is the center of the great State of Indiana. In the past ten years she has almost doubled her population, and the indications are that she will continue to increase her population from year to year. We have here some of the largest manufacturing establishments in the State. We have here located many large houses for the distribution of goods manufactured in other parts of this State and from other States. It has been thoroughly demonstrated to us as a Board that the best wishes of those men are with us in the management and success of our State Fairs. There are also many men engaged in merchandizing, both wholesale and retail, that have given us their best efforts to make our work a success. We have also had the able assistance of many of the wives, mothers, sisters and daughters of these same business men, without whose assistance we should have failed to make so many attractive features at our annual exhibitions.

We find here another class of men without whose assistance we could do nothing. Indianapolis is the center of the great railroad system of the State. Here are located the offices of the managers of the different lines. As a Board we are under many obligations to them for the assistance given to us each year in getting the people here at low rates of fare.

Policy on the part of the Board of Agriculture, if nothing else, would demand at our hands a recognition of the rights of this people. They ask it, and it is but right and just that it should be granted. With one of their own citizens on the State Board from year to year, they can better make known the wants of the city, and can more readily co-operate with the Board in everything that will have a tendency to make our Annual Exhibitions more of a success. I hope these suggestions will meet with the hearty approval of this Delegate Board.

As before stated, the Fair of 1881 was very successful. It was proved that the heavy drouth in many parts of the State would have a tendency to make the display in many of the departments a failure. But an examination of the different departments, showed conclusively that Indiana is a State of great resources.

The wisdom of the Board in casting off premiums in the Mechanical Department, and in lieu thereof giving the exhibitors every facility possible to make a display of their goods, has been fully confirmed. The display made in the Mechanical Department has never been excelled in any State, and only so at the Centennial Exhibition, by the display of a heavier line of machinery. The Board has now a sufficient amount of room to accommodate the exhibitors in this line, taken in connection with the fine building that has been erected by individuals and companies at their own expense. I would recommend that further privileges be granted to others that desire to erect buildings for their own accommodation.

The time has fully come when radical changes should be made in the management and conduct of Fairs; particularly in the awards of premiums. I think some effort should be made to make our Fairs entirely for the purpose of showing the quality of the animals or articles exhibited, instead of an exhibition of such for the money in it.

Gentlemen of the Delegate Board, permit me to again congratulate you on the favorable auspices under which we meet here to-day. It is needless for me to call to your attention the importance or the magnitude of the work entrusted to your care. The great interests of agriculture and manufacturing in the State of Indiana are in your hands. I think the Legislature of our State did a wise act in passing the law whereby the State Board of Agriculture was created. On you, as delegates from the different parts of the State, rests the responsibility of forming the Board out of the best material that can be found for the purpose. I take it for granted that you will agree with me when I say that no man should be elected as a member of the Board who is not recognized as a worker in the community where he resides. And the member who receives this honor at your hands should do so with the distinct understanding, on his part, that he will use every effort and means to make the work of the State Board a success.

Before closing I wish to say that, in my opinion, a great mistake has been made in the passage of the law by which the collection of the grain statistics is done independently of the State Board of Agriculture. I think this matter should be carefully looked after, as it is a matter of very great importance to the farming interests of our State. When the Legislature again convenes this should be remedied by the passage of a law placing this department where it properly belongs. I am also of the opinion that the work of the State Horticultural Society should be incorporated with that of the State Board of Agriculture, and their annual reports published in connection with the reports of the State Board, thereby giving information to thousands of the citizens of the State instead of hundreds, as is now the case.

In conclusion, I wish to extend my most sincere thanks to the many friends I have found since my connection with the Board. I have spent many of the best years of my life with you, and as time passes away and old age comes on apace, I shall ever be able to look back on the years passed with you with grateful remembrance. To those of the State Board with whom I have been most intimately connected, I return to them the kind wish that they may ever receive from their associates the same kind treatment that they have always accorded to me.

As my connection with the State Board of Agriculture may close with this annual meeting, I can not allow the opportunity to pass of publicly thanking Secretary Heron for the able assistance he has rendered me in the discharge of duties as an officer of your Board. I have found in him one of God's true, noble men. So long as he remains your Secretary, the trust in him will never be misplaced. May he, like the lamented Klippart, of the Ohio State Board, be retained at his post until called away by death only.

ROBERT M. LOCKHART,
President.

On motion of Mr. Mitchell, the President's address was referred to a special committee consisting of Messrs. John Sutherland, Dr. R. T. Brown and John Scott.

Next in order followed the

REPORT OF THE SECRETARY.

AGRICULTURAL ROOMS, DECEMBER, 1881.

Gentlemen:—I have the honor to submit herewith the annual report and financial exhibit of the business of the Indiana State Board of Agriculture for the year ending December 31, 1881.

FINANCIAL EXHIBIT.

Total receipts from all sources	$44,059 45

Expenditures.

	General cash orders	$24,061 43
	Premium cash orders	6,855 50
Dec. 31.	Balance in Treasury	13,142 52
	Total	$44,059 45

Itemized Receipts.

Jan. 4.	Cash in hands of Treasurer		$16,066 20
June 8.	Premium and interest on Government bonds sold		906 25
" 11.	Special appropriation, State Treasury	$1,800 00	
Dec. 20.	Special appropriation, State Treasury	2,200 00	
			4,000 00
Dec. 20.	Regular appropriation, State, for 1880	1,500 00	
" 20.	Regular appropriation, State, for 1881	1,500 00	
			3,000 00
Oct. 1.	State Fair admission tickets at 50c	13,902 00	
" 1.	State Fair admission railroad coupon at 50c	1,357 00	
			15,259 00

Oct.	1.	State Fair evening and half price, at 25c	$1,120 75	
"	1.	State Fair amphitheater tickets at 10c	773 60	
				$1,894 35
Oct.	1.	State Fair, rents of stands and privileges	1,588 70	
"	1.	State Fair, rents of stalls and pens	415 50	
"	1.	State Fair, entry fees, speed	620 00	
				2,624 20
Feb.	20.	Skating rink per centage	54 20	
June	—.	U. B. of Friendship (colored) rent	100 00	
July	—.	Gideon Band (colored) rent	75 00	
Sept.	—.	W. Beymer on rents, house, etc	40 00	
				269 20
		Sale of old sash and lumber	34 25	
Oct.	—.	J. P. Barns, account money returned	3 00	
Dec.	—.	Sinker & Davis, deduction on account	3 00	
				40 25
		Total		$44,059 45

STATEMENT SHOWING DISTRIBUTION OF EXPENSES.

General Expenses.

Members—per diem and mileage	$ 1,506 20	
Salaries—Secretary, Treasurer and General Superintendent	1,650 00	
Printing and advertising	833 68	
Postage and stationery	179 45	
Litigation, expenses, telegrams, etc	227 20	
Insurance	417 85	
Claims of past years paid	457 75	
Bonds canceled and interest account	12,167 18	
Total		$17,439 31

Construction and Repairs.

Lumber	$598 90	
Labor	791 95	
Machinery	395 44	
Roofing	629 90	
Hardware	89 59	
Pumps and repairs	171 82	
Whitewashing	128 00	
Total		$2,805 60

Current Expenses State Fair Week.

Gate keepers	$243 00	
Ticket sellers	178 00	
Labor, sweepers, engineers, etc	317 14	
Police	610 55	
Awarding committees	251 50	
Assistant superintendents	79 00	
Straw	241 05	
Fuel.	39 62	
Gas	152 60	
Music	100 00	
Horticultural department	491 95	
Museum department	51 60	
Medals, ribbons, etc	98 38	
Sprinkling, signs, checks, etc	107 30	
Specialties (speed ring)	182 00	
Woman's department	672 83	
Total		$3,816 52
Total amount of general cash orders		$24,061 43

Premium Awards.

Horse department	$2,731 00	
Cattle department	1,370 00	
Sheep department	610 00	
Hog department	640 00	
Poultry department	305 00	
Total amount live stock, orders		$5,656 00
Agricultural department	314 50	
Horticultural department	405 00	
Geology and Museum	51 00	
Total		770 50
Woman's Department	346 00	
Children's Department	83 00	
Total		429 00
Total amount of cash premium orders		$6,855 50

Also sixteen silver medals and forty-five diplomas.

FINANCIAL EXHIBIT—STATE FAIR—INCLUSIVE.

Receipts.

Admission tickets	$15,259 00	
Evening and half price tickets	1,120 75	
Amphitheater tickets	773 60	
Entry fees (speed)	620 00	
Rents of stands and privileges	1,898 15	
Rents of stalls and pens	415 50	
Total		$20,087 00

Expenditures.

Members' per diem (season)	$1,506 20	
Salaries of Secretary, Treasurer and General Superintendent.	1,650 00	
Printing and advertising	833 68	
Postage and stationery	179 45	
Litigation expenses and telegrams	227 20	
Current expenses Fair week	3,143 69	
Construction and repairs	2,805 60	
Woman's department	672 83	
Premium awards	6,855 50	
Totals		$17,874 15
Net surplus from State Fair		2,212 85
		$20,087 00

GEOLOGICAL DEPARTMENT.

The expenses of this Department have been confined to placing the cabinet in a proper condition for transferring to the State Geologist, paid out of the surplus Geological fund remaining in the treasury of the Board.

1881.	*Receipts.*		
January.	In treasury		$2,169 87
	Disbursements.		
	New cases for cabinet	$539 57	
	Cleaning, arranging and labeling cabinet	386 35	
	Total		$925 92
Dec. 31.	Balance		1,243 95
			$2,169 80

Attention is requested in the above exhibit to the item of construction and repairs included in expenses, which is more properly an investment.

The figures show an increase of $1,278 over the corresponding receipts of the State fair of 1880. We feel grateful to record such a result in view of the fact that the Fair was held under many discouragements. A national calamity at the opening of the Fair week had cast a gloom over the whole country, which seemed to paralyze all interest in social gatherings. The unprecedented drought had cut short the fall crops in a large portion of the State, causing the farming community to closely husband their finances. And, as if to try how much the Board of Agriculture could stand, the Fort Wayne Fair was in progress the same week; also the Illinois State Fair at Peoria, near the State line; the Chicago Exposition; the Louisville Exposition; the Stock Fair at the same place, and the Cincinnati Exposition, all of which were running excursion trains in this State—some of them at unheard of low rates; and as if to make a failure sure, the soldiers' reunion at Richmond was held the same week.

The gratifying result may be attributed in a large manner to the increased price of admission to fifty cents, which not only enabled the Board to pay the increased premiums offered in full, but leaving a surplus over, thanks to a liberal public that sustained the State Fair in spite of the extraordinary inducement to go elsewhere at that time.

The efforts made during the last session of the General Assembly to sell the fair ground property to the State, and thereby relieve the Board of its indebtedness, were not successful. A bill was passed appropriating $8,000 to pay the interest for two years on the $60,000 bonded debt of the Board, which has been drawn semi-annually for such purpose, and the interest paid up to this time.

The insurance on the fair ground buildings and the business connected with the guarantee bonds remains unchanged since our last report.

Of the sixty $1,000 bonds of the Board bearing 8 per cent. interest, due January 1, 1881, as reported at your last meeting, five have been paid and canceled, and fifty-five of them renewed at 6 per cent. interest by stamping across the face of each, in red ink, the following:

"At the request of, and for value received by, the owner of this bond, the same is continued with all its liens and mortgages and securities for five years, with privilege of ten years, to bear interest at the rate of six per cent. per annum from July 15, 1881. Interest payable semi-annually on the 15th days of January and July of each year at the banking house of John A. Hambleton, Baltimore, Md."

It is gratifying to note the increased interest manifested in the published annual reports of the Board, and the favorable reviews and flattering notice by the agricultural press of the country. Allow me to call the attention of the delegates to the importance of giving more attention to the annual reports from their respective localities, as the character of that district of country is often judged from the report as published, by those in distant States and countries, who seek the agricultural reports for such information. There is a sad deficiency in some of the county reports, and it is hoped that those at present handed in will show an improvement.

It is a matter of regret that the control of the State statistics of products was not placed in charge of the Board of Agriculture. It is the natural source for such information, as is demonstrated by the frequent applications from parties abroad making inquiries therefor. Other Boards of Agriculture control that part of their state work, and we are much embarrassed in council with the representatives from other Boards to arrange for a uniform mode of collecting statistics, as was experienced at the Inter-State Agricultural Conventions at Springfield, Ill., and more recently at Chicago, where your Board was represented by President Lockhart and Messrs. Mitchell, Custer and Meredith. The result of such meeting was the adoption of a resolution requesting that each Board of Agriculture unite in the adoption of some method to insure prompt and reliable statistics in connection with the Department of Agriculture at Washington. With such purpose in view, the Commissioner of Agriculture, Dr. Loring, has called a series of conventions, commencing on the 10th day of January next, and continuing several days, to which he invites delegates from this Board in a special communication, giving the specific arrangement, which is herewith submitted.

THE STATE INDUSTRIAL ASSOCIATIONS.

We have in former reports referred to the almost complete organization of all the special branches of industry connected with agriculture, being in advance in this respect of any other State, and again refer to them as being of almost vital importance to the Board of Agriculture to further the interests for which the Board was created. The encouragement received by the Associations from the Board, by the free use of the lecture room, has done much to bring them up to their present standing. No farmer can attend these meetings without being benefited. The practical experience of a lifetime spent in any special branch of farming, especially when it has been attended with success, is valuable to the young farmer, and in no way can such information be better secured. It is a source of regret that several of these Associations hold their meetings during this delegate convention, thus preventing you from attending their meetings, besides otherwise discommoding this Association. It is to be hoped a conference may be had with the different Associations to agree on some week later in the season for their meeting, whereby they can all have the use of the lecture room by holding successive meetings during the same week, and we feel assured that favorable railroad arrangements can accordingly be made. I would also suggest, in this connection, that this annual meeting should be held earlier in the season, say, in November, or some rule adopted whereby the county and district Agricultural Societies would be induced to not change their officers until after the Annual Delegate Convention, as we find it impossible to reach all officers and proper delegates, with notice of their meeting, owing to the fact that changes are not reported to this office (with an occasional exception) until the reports are handed in during the delegate meeting.

In thus reporting the success of the past year, we would be ungrateful not to acknowledge the aid from the press of the city and State, the railroad, express and street railway companies, and kindly encouragement on every hand from those with whom we have been associated.

There will be two vacant chairs at this meeting, occupied for many years past by the Hon. H. T. Sample, of Lafayette, and T. V. Mitchell, of Rush county, who died soon after the close of your last annual meeting.

Respectfully submitted,

ALEX. HERON, Secretary.

TREASURER'S REPORT.

GENTLEMEN:—I have the honor to submit the annual report of the Treasurer of the State Board of Agriculture for the year ending December 31, 1881:

Receipts.

To cash in treasury at last settlement	$16,066	20
From principal and interest on United States bonds	906	25
From special appropriation from State	1,800	00
From sale of stands and privileges	1,588	70
From rents of stalls and pens	415	50
From entry fees	620	00
From rents of ground	269	20
From miscellaneous	40	25
From 50,028 tickets, at 50 cents	25,014	00
From 10,000 tickets, at 25 cents	2,500	00
From 15,000 tickets, at 10 cents	1,500	00
From 2,714 railroad coupons, at 50 cents	1,357	00
From special appropriation from State	2,200	00
From State for 1880	1,500	00
From State for 1881	1,500	00
Total receipts	$57,277	10

Disbursements.

By amount paid on premium orders	$6,855	50
By 22,224 50-cents tickets returned	11,112	00
By 5,517 25-cents tickets returned	1,379	25
By 7,264 10-cents tickets returned	726	40
By amound paid on general cash orders	24,743	26
Balance cash on hands	12,460	69
Total	$57,277	10

GEOLOGICAL FUND.

Dr.	To balance on hand at last settlement	$2,169	87

Disbursements.

By payment on orders, from one to ten inclusive.	$829 42
Balance cash on hand.	1,340 45
Total	$2,169 87

Respectfully submitted.

J. A. Wildman, Treasurer.

GENERAL SUPERINTENDENT'S REPORT.

To the President and Members of the Indiana State Board of Agriculture:

Considering the adverse circumstances preceding and attending the preparation for and holding of the last State Fair, you have abundant reason to be well satisfied with its success, and deserve the congratulations of well wishers.

Preceded by a drouth of intensity and duration never before known since the settlement of the State, and, in addition, the striking down of the head of the Nation by the hand of the assassin, his lingering between life and death, awakening in the minds of many gloomy forebodings of the future, and uncertainty as to business investments; his death occurring but the week before, and his funeral on the opening day of the Fair, which was generally observed as a day of mourning and the suspension of business, most of the railroads running no freight trains on that day, thus delaying many articles and animals intended for exhibition, and in some cases entirely preventing their intended shipment.

The advance in the charge for admission, so long kept at twenty-five cents, to fifty cents, created much dissatisfaction even with many who felt anxious for and took an active interest in the success of the Fair as under the adverse influences referred to. The time for the advance was deemed unfortunate if not improper, as the reasons for making the advance, when, how and by whom adopted seemed not to be understood. The prevailing opinion seemed to be that though the Fair might be a reasonable success as an exhibition, the attendance would certainly be light. This had a very depressing influence on the sale of refreshment and other privileges, and few sales were made before the actual opening of the Fair, when we had quite a rush and near the average amount of income from that source was realized. Some also who would have exhibited, some of them extensively, were discouraged at the prospect and did not do so, feeling that the labor and expenditures to be incurred were not justified by the prospects. Yet notwithstanding these drawbacks and discouragements, the Fair of 1881 will go into history as a grand success, never equaled in Agricultural implements and machinery, and up to its usual superlative excellence in the stock departments. But I will not speak further as to the exhibition as you will have detailed reports from the superintendents of the different departments. In accordance with my suggestions and also of the Committee on Grounds, I had the fences removed and extended so as to take in the vacant ground belonging to the Board east of the building and between the old fence and the ditch thus adding an acre or over to the grounds and which was fully occupied by saw mills, tile mills and other heavy machinery. In accordance with the course heretofore adopted, parties desiring to build halls for the exhibition of implements and manufactured or dealt in by themselves, were allowed to do so, and roomy ornamental buildings were erected by Messrs Conde & Co., Caylor and others, and as the time for the Fair approached it became evident from the number of applications and the amount of space applied for, that the exhibition of agricultural machinery, especially self binders and also of implements that we could accommodate but a portion of the applicants with shafting and shelter. On consultation with the President, Ex-president Ragan, Secretary Heron, and others it was deemed best to put up two new buildings, plain and cheap, but substantial and durable and accordingly one was erected 150 feet long and 30 feet wide, with a line of shafting the entire length for the exhibition of machinery in motion, and one 150 feet long by 40 wide for implements. On examining the central or deck roof of the main building, it was found to be too far gone for repairs and I accordingly had it recoated. The old building formerly known as music hall and later as dining hall, formerly standing north but latterly east of the main building, and a serious blemish to the grounds, was, on careful inspection found to be in a very insecure and dangerous condition, and was torn down and the material used in the new buildings, the repairs of bridges, etc.

The horse stalls and the fence on the east side of the grounds are in fair condition, but those on the north including the fence are in such a state of dilapidation and decay as to justify complaint from exhibitors and call for their entire reconstruction. The same remarks will apply to the fence on the west side and the hog pens connected with the same. The cattle stalls also need general repair.

I would advise that in future the grounds should not be rented and that stock be absolutely prohibited from running loose on the same. As my receipts and expenditures appear in the reports of the Secretary and Treasurer, I deem it unnecessary to report them here. I trust that on examination they will be found satisfactory.

FIELDING BEELER, General Superintendent.

On motion of Mr. Seward, the reports of the Secretary, Treasurer and General Superintendent were referred to the Committee on Finance.

REPORTS FROM DEPARTMENTS.

HORSE DEPARTMENT.

ROBERT MITCHELL, SUPT.

Mr. President and Members of the State and Delegate Board:

GENTLEMEN.—In submitting a brief report of the Horse Department, I have to say that the show of horses was very numerous, and almost exclusively Indiana horses, which speaks well for the horsemen of our State.

Book 1, *Heavy Draft.*—Forty-eight entries. Many of them very fine specimems of that highly esteemed breed, and quite a number of them had been lately imported to this country.

Book 2, *General Purpose.*—Eighty-six entries. All from Indiana except one from Kentucky. In this class many superior animals were led into the ring, and, of course, where there was so many exhibitors, much disappointment, and the only wonder was that awards could be made with so little complaint. In fact, the awards, with but few exceptions, met the approbation of the horsemen.

Book 3, *Light Harness.*—Fifty-five entries. All from Indiana except one. Many of them very fine harness horses, and quite a number of handsome double teams were shown which attracted much attention.

Book 4, *Speed.*—Thirty-six entries, and, considering the purses offered, there was good exhibitions of speed, especially in the pacing races; Indiana furnishing all the trotting and pacing horses, showing that the breeders of this class of horses in our State have an eye to business.

Book 5, *Saddle Horses.*—Ten entries; eight from Indiana, two from Kentucky.

Book 6, *Sweepstakes*—Fifty-eight entries of all classes. Considerable time was used by the committee in making this award, and it seemed almost impossible to select the best horse where there were so many good ones, but after a careful examination of all the horses by the committee, an award was made which was severally criticised by the spectators and horsemen

Book 7, *Jacks.*—Thirteen entries. All from Indiana, and some of them were very fine jacks. No jennets on exhibition.

Book 8, *Sweepstakes on Jacks.*—Eight entries. Making a total of all entries in the horse department of 314.

This was a large display of horses and a very creditable one for our State. The absence of horses from Illinois is due to the fact that both Fairs are held on the same week, and I would suggest that some action be taken by the Board at this meeting that would avoid this difficulty in the future. I would also suggest that a rule be adopted, and made imperative, that no one can claim a stall for horses until it is paid for, thereby saving the General Superintendent much trouble and the treasury from loss. Many of the horse stalls are in a very poor condition, and I would recommend the building of one hundred or more for the better accommodation of the exhibitors. Another point that seems to need special attention in the form of a well defined rule, governing a class of exhibitors known as fast horsemen. They seem to think that they are the special guests of the officers and managers of Fairs, and that all the rights of other exhibitors must be waived and their's only considered. As long as officers of an agricultural society compel that class of exhibitors to repect the rules of the society and control them as other exhibitors expect to be, then good races and good entertainment will be the result; but the moment that the officers of an agricultural association yields the control to the fast horsemen, then they become a nuisance upon any fair ground. And it might be well for this association to become a member of the American Trotting Society. By so doing a better class of horses would be likely to attend the Fairs, and the rules of the society would be respected by the owners and drivers. The Judge's stand ought to be repaired, and the entrance made by a stairway from the outside, instead of the inside as it now is. The committees in my department worked hard to do their work well, and, with one or two exceptions, gave good satisfaction. The exhibitors, as a rule, were courteous and gentlemanly, meeting victory and defeat with a smile. With these recommendations, this report is respectfully submitted.

CATTLE DEPARTMENT.

S. R. QUICK, SUPT.

Mr. President and Members of the State and Delegate Board of Agriculture:

Having in charge the Cattle Department, I have to report that the show altogether was magnificent. The show of Short Horns was most excellent in quality as well as numbers, a great portion of them being from our own State.

The exhibitors were Gaines & Son, Illinois; Thomas Wilhoit, Indiana; Wm. H. Tressler, Indiana; Samuel Purcel, Indiana; G. W. Lancaster, Indiana; and G. W. Blackmore of Indiana.

The Jerseys were also well represented, I think the largest show of Jersey cattle that was ever shown in Indiana. The exhibitors were Garretson & Son, Indiana; Scarf & Son, Ohio; J. O. Haughey, Indiana; W. J. Hasselman, Indiana; Churchman & Jackson, Indiana; J. J. Stratton, and W. A. Ketchum of Indiana.

There was also a good show of Polled Angus and Herefords. The exhibitors were Perry Lutz, of Lafayette, Ind., and Burley & Co., of Maine.

There were but few Devons and Ayershires on exhibition, but they were good specimens of their breeds and did credit to the exhibitors.

Total number of entries, 184.

I might here with propriety say that our increase in premiums brought us a larger and better show of cattle than ever was exhibited here before.

SHEEP DEPARTMENT.

HENRY C. MEREDITH, SUP'T.

The exhibition in this department for 1881, was creditable in numbers and quality. The records show the following entries in the several classes:

Book 14—Fine Wools	43 entries.
Book 15—Leicester and Lincolns	13 entries.
Book 16—Cotswolds	68 entries.
Book 17—South Downs	58 entries.
Book 18—Oxford and Shropshires	41 entries.
Book 19—Sweepstakes	93 entries.
Total number entries	316
Entries in classes were	223

Taken by States the entries were:

	Indiana.	*Ohio.*	*Kentucky.*	*Illinois.*
Fine Wool	22	21	. .	. .
Leicester and Lincoln	8	. .	5	. .
Cotswold	30	15	23	. .
South Down	6	12	40	. .
Oxford and Shropshire	4	17	2	18
Total	70	65	70	18

Kentucky exhibited as many sheep as our own State, while Ohio only fell short 5 entries.

Out of more than a million and a half of sheep at present in this State, only 70 head of them were exhibited at our State Fair.

The total amount of premiums paid was $610.00 and receipts for rent of pens, $23.25.

From the above figures it is evident that a necessity exists, that some measures should be taken by the Board to encourage and bring out to our exhibitions the sheep breeders of the State. We do not certainly expect to limit the giving of premiums to animals owned within the State, but it would be of very much more credit to us as a Board of Managers and to the great grazing interests of which we are officially the representatives, if a very large and superior exhibition should be made by our State breeders, rather than to have as now an ordinary exhibition as to numbers and less than one-third of these representing the great State of Indiana.

There is evidently a lack of interest among our home breeders, and we should make an effort to arouse them to the importance of more enterprise in this leading profitable industry of the farm. It is not enough for us to hold exhibitions annually in this city and let people come or not, as they will. We must inaugurate new rules and regulations, offer more premiums and make personal visits to all the local fairs to induce our home breeders to attend.

In the interest of all exhibitors and of the Board as well, I would advise that a more careful selection of judges be made than has been usual in this department. I think this is one great cause for complaint. A system of inspection should be adopted that would prevent the violation of a plain rule of the Board by which stubble and otherwise improperly shorn sheep shall be excluded from competition. This can only be successfully done by having a competent man make critical examination of the sheep before leaving the pens, and such as are improperly shorn ordered to abstain from showing.

It is a subject of mortification for me to state that some of our best prizes were awarded to stubble shorn sheep, in direct violation of our rules, and that I, as Superintendent of the Department, was powerless to prevent it.

The higher standard we make for honorable and fair competition and with skilled judges to make awards, the better Fair we may expect to have and the greatest good will be gained to the people.

Indiana has a large number of sheep of the improved breeds and the fact that the product of wool is about double that of thirty years ago, while we have fewer sheep than then, and the price per head is more than double their worth at that period, shows that there has been a great advance in their value.

The State is peculiarly adapted to sheep breeding by reason of varied climate, plenty of pure water, the best of grasses and the easy production of all kinds of grain. The sheep is with proper and intelligent care the most profitable of all animals. It gives two crops per year—wool and lambs—the productions are readily marketed at cash value. It is a simple animal in its tastes and requirements, and we owe it to this large interest to give all the possible aid and encouragement we can.

SWINE DEPARTMENT.

L. B. CUSTER, SUPT.

To the State and Delegate Board of Agriculture:

As Superintendent of the Swine Department at the late State Fair, I submit the following report:

The show of hogs was quite large and attractive, not so large, however, as for the past two or three years, but the quality was fully as good. The prices of hogs having been low and the corn crop short, no doubt discouraged the breeders of swine, consequently the hog crop for this year has been less in numbers and lighter in weights; but the present prices are such as to create a stimulus among the breeders to increase their herds. Raising stock is conceded to be one of the essential sources of profit to our people, and as every thinking person will admit that good stock insures the greatest reward, it should be the aim of every farmer to bring his breeds up to the highest standard of excellence.

The number of entries were not up to that of the past few years. The following was the number of entries in the different classes:

Poland China	149	Entries.
Berkshire	111	"
Essex and Suffolk	6	"
Chester White and Jersey Reds	23	"
Total number of entries	289	Entries.

Among the exhibitors of Poland Chinas were A. E. Slaughter, of South Charleston, Ohio; E. E. Elliott, A. S. Gilmour & Co., D. L. Thomas, A. W. Ross, W. C. Williams, J. Cunningham and some others of this State, all of whom exhibited superb specimens.

In the Berkshire class were to be found, A. S. Gilmour & Co., J. Heck & Co., J. Y. Demere, Wesley White, W. H. Jones, I. N. Barker, James Riley, D. Canady, A. W. Martin and probably some others. The animals shown were not only fine in quality, but they were exhibited in the most attractive condition.

I can not name the exhibitors of Essex, Suffolk, Chester White and Jersey Reds. They were represented by animals of merit.

The competition was close and spirited, the work of the committee arduous; to determine which was best was a difficult task, after a very close and searching examination of each animal.

I must be permitted to say that the awarding committees were composed of gentlemen who were competent, careful and discriminating. It is to be hoped that in all committees, men of like good qualities may be selected, who will be able to discharge the duties assigned them with the same intelligence and ability.

POULTRY DEPARTMENT.

R. P. HAYNES, SUPT.

Mr. Haynes made the following verbal report:

When I arrived on the grounds I found Dr. W. J. Elstun, Secretary of the State Poultry Association, in charge of the Poultry Department, which, under his care was well managed. I retired after seeing it so well conducted. However, I visited it several times during the Fair to see how things were getting along. Those in charge acquitted themselves with great credit. I was much gratified at seeing such a fine show of poultry.

AGRICULTURAL DEPARTMENT.

Vegetables, Grains, Seeds, Etc.

J. K. O'NEAL, SUPT.

Mr. Lockhart, President of the State Board of Agriculture:

As Superintendent of the Agriculture Department, it gives me pleasure to be able to say, that notwithstanding the great drought during the past season, which of necessity affected more severely this than any other exhibit, the display was unusually fine and added yet another evidence of the practicably unlimited productive power of our great commonwealth. The most marked features of the display were mainly from counties that have long been branded as too wet for successful cultivation. The sloughs of White County come forward with the largest ears of corn; monster productions as a startling hint of the rich reward, for ages to come, that awaits the thorough drainage of this class of our wet lands.

I hope Mr. President in this connection, you will allow me to digress so far as to state that I too am the advocate of the dawn of a New Era, but that my Era is to be ushered in through the medinm of the tile drain. When it comes it will come to stay and be clothed with the richest reward ever bestowed on patient labor. I would fail of my duty were I not to mention the valuable aid rendered by my assistant, Mr. Allen, of Washington, Ind., to whose untiring labors much is due for whatever of success was reached. I earnestly recommend that liberal premiums be offered in the future to displays by societies and Counties as well as individuals, thereby adding largely to the interest in this Department.

TEXTILE FABRIC DEPARTMENT—WOMEN'S STATE FAIR ASSOCIATION.

MARY E. HAGGART, SUPT.

Financial Exhibit of the Women's State Fair Association, for the year 1881:

RECEIPTS.

Appropriation by State Board for premiums and current expense	$1,000 00
Appropriation by State Board for permanent improvements, decorations and supplies	200 00
Fund for State work	23 08
Earnings of Association in 1881	33 80
Total Receipts	$1,256 88

DISBURSEMENTS FOR CURRENT EXPENSE.

Premium awards	$429 00	
Diplomas	2 00	
Rent of show cases, 264 feet	100 50	
Awarding committees	41 00	
Supplies	16 25	
Entry clerk	6 00	
Men assistants	23 00	
Stationery	5 00	
Postal Expenses	10 00	
Soliciting special premiums	28 50	
Salaries	338 75	
Total current expense		$1,000 00

DISBURSEMENTS FOR PERMANENT IMPROVEMENTS, ETC.

Upright show case, purchased	$30 00	
Decorations	24 30	
Supplies	31 70	
Improvements	15 83	
Total		101 83
Disbursement for general State work		15 80
Total expenditures		$1,117 63
Remaining in Treasury of State Board from appropriation		98 17
Remaining in Treasury of State Board from earnings of Association in 1881		33 80
Remaining in Treasury of Association from State work fund		7 28
Total		$1,256 88

Total number of entries of 1880	1,023
Total number of entries of 1881	980

Mr. President and Gentlemen of the State Board of Agriculture:

Concerning the exhibit of the Woman's Department, it may be truthfully said that it far surpassed all former exhibits, both in the excellence of articles entered and the systematic classification of the work on exhibition. No adequate estimate of the real extent and importance of the exhibit of this Department can be made until it is taken into consideration that the rule adopted last year, viz: to exclude all articles which had drawn two or more premiums, was most strictly enforced. Of course it is almost needless to state that the enforcement of this rule secured an exhibition remarkable for its freshness and novelty, and consequently instructive, entertaining and attractive to visitors.

One notable feature of the exhibition of our Department at the last Fair was that the State generally was much more extensively represented than ever before. This was no doubt due to special solicitation through correspondence by our Secretary and to the printed circular sent out by our Association during the early part of the summer. In fact, it may be claimed that the extensive advertising given the Woman's Department, and, indeed, the whole State Fair, through our circular and through the numerous notices and reports of our executive meetings during the month of September, both in all of our city and many of our State papers, contributed immensely to the importance of our exhibition and aided materially in calling out a large attendance at the Fair.

There can be no question about the stimulating power of special premiums; and for all of the numerous and valuable special premiums offered by our Association there were competitors. Many of the finest articles of our exhibit were entered for special premiums. About forty were offered, varying in value from $5 to $55. Including the special with the regular premium estimate, it will be seen that we offered in all $896 in premiums.

The excellence of our exhibit, however, was greatly enhanced by the truly fine and magnificent displays made by the business women of this city and of this and other States. An enterprising lady of St. Louis added greatly to the business display, and stated in a communication sent with her goods that she believed Indiana to be ahead in the matter of State Fairs, not excepting even the much-extolled Fairs of St. Louis, and this, principally, on account of the Woman's Department. Among the more noteworthy attractions of the exhibition in our Department may be named a wonderfully fine display from the Silk Culture Association of Philadelphia, a display of fancy needle-work and curious hand-work done by Indian children and sent by one of the Indian Mission Agents, a strikingly large and attractive display from our Blind Asylum, comprising curious, artistic and quaint articles wrought into rare shapes of beauty and utility by Indiana's sightless children, and the daily exhibition of Miss Chapin's kindergarten school, which afforded no end of entertainment to the country visitor.

On Friday (children's day) special attractions were offered in the way of an exhibition of the training of the children of the Colored Orphan Asylum and of the musical drill and culture of the pupils of the Blind Asylum, which exercises were pronounced in themselves well worth the price of admission to the Fair.

The Children's Department has grown into proportions which render it a striking feature in the Woman's Department. Premiums to the amount of $112 were offered in this Department, and the exhibit was beyond all question full, fine and wonderful. *The novel* attraction was the literary and press exhibit, representing the work of the brains of Indiana women. The collection of this display was designed in the main to bring out into tangible shape the fact that Indiana women have brains as well as hands and feet.

Of the $200 appropriated by you for permanent improvements in our Department, $86 were expended in purchasing supplies of a permanent character, designed to use from year to year. In fact, all supplies, even those bought out of our general fund, are of a permanent character, designed for future use, and are now carefully packed away, after the manner of thrifty, thorough-going housekeeping style.

Thirty dollars of the above named $86 were appropriated to the purchase of an upright show-case, a style of case which we could not rent and which was absolutely indispensable in the arrangement of our exhibit. Fortunately, this case has not, as was prophesied, proven an "elephant" on our hands, for we have rented it out at a fair price until the time of the next State Fair.

The earnings of our Department were: For rent of space, $25.00, and for rent of show cases, $8.80, making in all $33.80, which amount was duly turned into the Treasury of the State Board.

As Superintendent of this Department, I, as well as our exhibitors, experienced considerable annoyance in regard to the matter of exhibitors' tickets. I take the liberty here to suggest that in the future there be a distinct and explicit understanding in regard to whom exhibitors shall apply for tickets, also some system and method in their distribution.

As has been stated in former reports from this Department, the necessity for purchasing show cases outright becomes more and more apparent from year to year. Of the $1,000 appropriated by you to meet the current expenses and pay the premiums of this Department, $100 were used to pay for rent of show cases. This desire on the part of our Association to buy these cases and own instead of renting them, is discouraged because no safe place of storage can be guaranteed by the State Board. In regard to this objection, I will say that you may safely trust our women with the care of this property, for, true to their superior financiering ability, they have found that, instead of proving an expensive and annoying burden on our hands, they can be made, in due course of time, to pay for themselves, as they can be rented out during the year at a fair price and to careful, reliable parties. Looking forward to the future importance of this Department in our State industrial exhibitions, the women of our Association have already begun the work of soliciting the donation of articles to be collected into a museum or permanent exhibit of the industries of the women of the State; and it is designed in this connection to call your attention to the fact that a wish exists on the part of our Association to be vested with authority to purchase articles for this permanent exhibit whenever rare opportunities are offered. Of course, we have traversed the ground over only as far as is at present practicable, and have already, in the prospective, picked out an unobtrusive corner, as is usual for women, in the grand State edifice now under construction just across the way, in which to place on exhibition this permanent museum or display of the industries of Indiana women.

That which tries most the souls of the faithful workers of our Association is the fact that the amount of work and energy expended in preparing our Department for exhibition bears no comparison to the number of days through which the display is conducted. Our exhibitors expressed themselves, without exception, in favor of continuing the exhibition through a sufficient number of days, at least, to pay them for their time, trouble and expense in making a display.

Gentlemen, the Woman's State Fair Association has now passed over the boundary line which separates experimental existence from demonstrated actual staying success. An undercurrent of earnest purpose has been so steadily at work in our organization that the remotest boundaries of the State have felt our influence and responded to our solicitations. It is now proposed to form County Associations, controlling Women's Departments at County Fairs, and that finally these County exhibits shall be classed in their order in the State Fair display. Of course, to carry on this work and bring our Department up to our ideal of such a Department, we need your co-operation, your counsel, and last, but not least, an appropriation of funds for the work of 1882, not one cent less than the amount appropriated by you to conduct the work of the year just closed.

Respectfully submitted,

MARY E. HAGGART,

Superintendent Woman's Department.

AGRICULTURAL MACHINERY DEPARTMENT.

T. W. W. SUNMAN, SUPT.

To the Honorable President and Gentlemen of the Delegate Board of Agriculture:

In this, the Mechanical Department, the exhibition was far ahead of the most sanguine expectation. There was every variety of machinery exhibited; articles tending to lessen the labor of planting, harvesting and preparing to feed was very numerous. Noticeable was the exhibits of Tyner & Hadley, Jefferson Caylor, C. E. Merrifield, Ewald Over, H. T. Conde and many others whom I can not now name. I will say that to enumerate the articles of special merit, it is impossible; but that the exhibit far exceeded any similar exhibition ever held in America outside of the Centennial at Philadelphia. I was applied to for space to locate twenty-nine steam engines, including threshers, saw mills, etc.—a remarkable exhibit.

Since the erection of the additional buildings the accommodations were much better than formerly, but I think it would be advisable to erect additional buildings, and put up additional shafting for power. Also, that the Superintendent of this department, be the proper person to distribute the tickets to exhibitors, as he is acquainted with the articles exhibited and number of assistants actually necessary to have charge of the exhibits and consequently could not be imposed upon as the Superintendent of Permits intimated in his report yesterday.

CARRIAGES, WAGONS AND FURNITURE.

T. M. KIRKPATRICK, SUPT.

This department was well filled with useful and beautiful articles occupying the greater portion of the east end of Exposition Hall, on the first and second floors. Being a new hand at department superintendence, and having some anxiety in reference to the success of the special department assigned to me, I visited the Fair grounds on Thursday, previous to the opening of the Fair, for the purpose of learning the location and space to be occupied by my department, and to learn if I would need any assistance. Finding the space ample and convenient, there was no need of help, and the duties being made lighter by the help of W. H. Ragan, who assigned space to the exhibitors in my absence.

Some of the reflections natural to a person visiting this department would be the development of our State in point of good roads and the fitting of dwelling places for man. Fine carriages for good roads and fine furniture for good houses. These, with our churches and our system of schools for all, makes the State of Indiana a very desirable place to live.

I make no special mention as that would seem to be the province of Examining Committees.

GATES AND AMPHITHEATER.

JOHN P. BARNS, SUPT.

Reported that when the Fair closed he had made out his pay roll, and filed his receipts with the Secretary.

The President appointed the following named gentlemen from the delegates to act in conjunction with the regular standing committees, as follows:

On Finance—Messrs. Ragan, Mutz and Mitchell of the Board, and Messrs. Ratliff and Jones of the Delegates.

On Rules and Regulations—Messrs. Meredith, Quick and Sutherland of the Board, and Messrs. Chamberlain and Seybold of the Delegates.

On Fair Grounds—Messrs. Custer, Kirkpatrick and Sunman of the Board, and Messrs. Blessing and Hargrove of the Delegates.

On Premium List—Messrs. Barns, Gilbert and O'Neal of the Board, and Messrs. Banks and Davidson of the Delegates.

On Unfinished Business—Messrs. Hancock, Haynes and Seward of the Board and Messrs. Hendry and Foulks of the Delegates.

On Geology and Natural History—The Executive Committee.

The following were the nominations made to fill the places of the members of the Board whose terms expire with this meeting:

First District—Robert Mitchell, of Gibson County.

Second District—H. J. Johnson, of Martin County and Samuel Hargrove, of Pike County.

Third District—B. H. Hancock, of Washington County and John Q. A. Sieg, of Harrison County.

Fourth District—W. B. Seward, of Monroe County.

Seventh District—Jacob Mutz, of Shelby County, and S. W. Dungan, of Johnson County.

Fourteenth District—L. W. Custer, of Cass County.

Fifteenth District—W. A. Banks, Laporte County, and Bartlett Woods, of Lake County.

Sixteenth District—R. M. Lockhart, of DeKalb County.

Dr. A. C. Stevenson then read an interesting paper on "Indiana Inducements to Immigrants," which will be found in full in this volume.

On motion of Mr. Hancock thanks of the Board were returned to Dr. Stevenson and the paper requested for publication.

The Board took recess until 7:30 evening.

Board met at 7:30 o'clock, when, as per program, Prof. John L. Campbell, of Wabash College, read a paper (which will be found elsewhere) on the Topography of Indiana, which, on motion of Mr. Gilbert, was requested for publication, and thanks of the Board returned therefor.

Dr. R. T. Brown read a paper on "Home Agricultural Education," for which the thanks of the Board were returned and request made for its publication in the annual report. The paper will be found elsewhere in this report.

Mr. Sutherland then entertained the Convention with the following remarks:

Mr. Chairman, Ladies and Gentlemen:

I hardly feel that I could interest you after being so well entertained by two professors. I would like to present to the State Board of Agriculture this cedar shingle which I hold in my hand. I obtained it from the village of Farmington, ten miles from Hartford, Conn. It was placed on the roof of a church in the year 1771, and was removed in 1880, being one of the few that were a little defective, after being on the roof 109 years. During my trip last summer in the New England States I stopped at a little town called Amesberry, on the Merrimac River, the greatest stream in the United States for manufacturing purposes. While there I obtained this brickbat (holding it in his hand), which I present to the Board. It was taken from the chimney of a building belonging to a woman who was hung for being a witch. In going back and comparing their country with Indiana, there is evidence of their ignorance, and we have great reason to hope that if we live 250 years, we will stand pretty fair in the world.

The subject which I wish especially to treat on this evening is one which most of you have given but little thought. Some three years ago I saw in a paper where a man had cut up some green corn and put it in a hole in the ground, covering it up until winter, and it kept well. Since then I have given the subject considerable thought. While in the East this summer, at a little town called New Brighton, near Hartford, Conn., I made some inquiry in regard to it. I was told that there was a man in that section putting it up in his silo. A silo is a deep cellar. They are built of various sizes. The one I visited was about fifteen feet wide and twenty feet deep, walled up with cement and lime. They plant their corn in drills and cultivate it; when the corn is just beginning to form ears they cut it up and take it to those silos; there they run it through a cutting box, cutting it up about three-eighths of an inch long; it is then stored away in the silo, tramped down until it is full, when it is covered with a little straw; boards are then put over it and weighted down with earth or stone, about 150 pounds to the square foot, making it air-tight, the same as canning fruit. I saw one silo where the ensilege had not been used out. This was in the last of August. It had been in all winter, was slightly acid and a little colored on account of exposure. This method seems to meet with universal favor with all those who have tried it. We had a great drought here last summer, and we need something of this kind to overcome this difficulty. This method puts us in an independent condition, as you can have feed the whole year round, regardless of dry weather, and this ensilage can be put in the silo easier than you can get your feed in the barn, and the stock will eat it and do well on it. By this method a family who could afford to keep ten cows can now keep twenty, and the small farmer be equal with the larger. The Jerseys are the predominating breed of cattle in that country. I don't suppose you could find 200 head of Short Horn cattle in the State of Connecticut, while off of one farm I could almost get that number of Jerseys. It was an evidence in my mind that the Jerseys were the cattle for the people of that State. It is an established fact that the Jersey is the cow for milk and butter, but many of my friends here will not indorse it, as you are Short Horn men. We are just in our alphabet in the line of farming, and don't know much about it in a close way.

On many farms in our County there is more going to waste than I saw in the entire State of Connecticut. There they have learned to economize to the penny, and are neat and tidy, while we are less economical and great slovens as compared with those Eastern people. From what I have seen in this direction, there is a new era dawning, and I have no doubt that Marion County in five years more will have 100 silos, if not 500.

Board adjourned until to-morrow morning.

SECOND DAY.

MORNING SESSION.

WEDNESDAY, JANUARY 4th, 9 A. M.

Board met pursuant to adjournment. President Lockhart in the chair. All the members present and delegates responded as yesterday.

Mr. Barns moved that Mr. Sunman be recognized as the delegate from Ripley County. After some discussion,

On motion of Mr. Beeler the motion of Mr. Barns was referred to the Committee on Credentials.

On motion of Mr. Sunman the votes by which other delegates had been admitted without proper credentials were also referred to the same committee.

Mr. Ragan from the Finance Committee reported as follows:

Your Committee on Finance, to which was referred the reports of the Secretary and Treasurer, beg leave to report that they have carefully compared the books and vouchers on file and find them in all particulars correct.

W. H. RAGAN,
JACOB MUTZ,
ROBERT MITCHELL,
JOHN RATLIFF,
AARON JONES,
Committee.

The report was accepted.

Mr. Meredith from the Committee on Rules and Regulations reported certain amendments therein which, on motion of Mr. Gilbert, was referred to the Board proper, to be considered at the February meeting.

Mr. Custer from the Committee on Fair Grounds reported:

Your committee has attended to its duties and begs leaves to report that the Fair grounds have been visited. We found the Exposition building clean and everything in good order. The tools, belts and other loose property are stowed away. We found small leaks in the roofs about the towers that should be repaired. The horse and cattle stalls and hog pens, with the fences on the north and west sides need repairing. The other buildings are in good condition. We find some live stock running at large on the grounds and would recommend their removal.

L. B. Custer,
T. M. Kirkpatrick,
T. W. W. Sunman,
John Blessing,
Samuel Hargrove,
Committee.

Mr. Barns, from the Committee on Premium List, asked for further time, which was granted.

The President added Mr. Gould, of Fulton, and Mr. Davidson, of Gibson, to the Committee on Geology and Natural History.

On motion of Mr. Jones, Mr. Heron, Secretary of the Board, was appointed to attend and represent the Board at the convention called by the United States Commissioner of Agriculture, to be held at the city of Washington, January 10, 1882.

President Lockhart. There were ten States represented at the meeting in Chicago on the 9th of September for the purpose of making an Inter-State organization for securing statistics. It is a great mistake in taking this out of the hands of the Board of Agriculture. I take this ground, that, in my judgment, the proper way is through the State Board of Agriculture to get them before the people and the local societies throughout the State. It could be brought down to a finer point by getting the Trustees to send those reports to one of the County officers and let them report to the State Board of Agriculture, which could in a brief form give it to the world in the press reports. I have in my hand a letter from the Imperial Consulate at Cincinnati, who is very much interested in the statistics of this country. In that Convention held at Chicago arrangements were made that all those States, and many others, are to be represented in Washington during the meeting to be held on the 10th of January by Dr. Loring, Commissioner of Agriculture.

Mr. Ingersol. It has been in my mind that this is one of the important things which this Board should take up. The State Board is composed of representative men from different parts of the State who have some influence over the management of the reports from the various parts of the State. I think we should brighten up a little more on this subject. In the State of Ohio the reports from the Secretary of their Board, Mr. Chamberlain, will be published quarterty or monthly, as the case may demand, so the people can tell the condition of the crops in the State. One way in which he works in reference to the yield of grain, instead of sending it to the various officers, he sends blanks to the threshing machine men of the State. The threshers, he thinks, know about the yield of the wheat better than the single farmer can know. We can devise many ways in which to collect those reports. We want reliable information, and that which comes quickly and promptly, so we can form an opinion in regard to our crops. Europe is our great market for grain and beef, and it is right and proper that we should have statistical reports from that country. We have a Bureau of Statistics, but it does not come prompt enough. We should put it in the hands of the farmers, where it will do the most good.

Mr. Jones. I think this matter of gathering statistics should go over the Atlantic; agriculturists of the United States ought to take into consideration the crops of the old country, as this is one of our best markets. It is much to our interest to know the condition of crops in Germany, France, Russia, England, and all countries coming in competition with the markets of the world. We should take some steps whereby we can be informed of the condition of the crops in the old world, where we ship millions of bushels of grain. It is necessary for us to know how much may come from Australia and other parts, and the means of ascertaining this information might emanate from the State Board of Agriculture of Indiana as well as any other State. This I regard as one of the most important things which this State Board of Agriculture can do.

Mr. Haynes. I understand the prime intention is to get up some statistics in our State. Indiana is divided into counties and subdivided into townships. In every district they are sworn to give in their list of property, and the present arrangement is the best for getting statistics of any State. If you take this matter away from those who are not under oath and give it to the threshers, who are not under oath I fear we will not have anything that is very reliable.

Mr. Sutherland, from the special Committee on the President's address, submitted the following:

Your Committee fully concur with the President in the urgent necessity of so arranging the agricultural districts as to more equally distribute the representation according to population and business importance. The act incorporating this body fixes the number at sixteen, but does not assign them to any particular locality; and as this matter will demand time, thought and labor, we recommend that the subject be referred to a Committee to consist of two members from the Delegate and three from the State Board, with instructions to report at the next annual meeting of this body.

That the change in premiums, which substitutes a report of the merits of the article exhibited, has worked well in regard to farm implements, machinery, etc., we are glad to know, and that it might be extended to other classes of exhibits is probable, but such changes should be gradually and cautiously made.

In the collection of grain statistics it would seem proper that this matter should be in the hands of the County and State Boards, but at present we have not the working machinery that will insure the promptness and accuracy that is demanded.

Your Committee would recommend that the delegates from Rush and Tippecanoe Counties be appointed a Committee to present suitable resolutions regarding the decease of Thos. V. Mitchell, of Rush County, and Henry T. Sample, of Tippecanoe County.

Suffer us also to call attention to the suggestion in the Secretary's report as to the time of holding the annual meetings of this Board.

JOHN SUTHERLAND,
RYLAND T. BROWN,
JOHN SCOTT,
Special Committee.

On motion of Mr. O'Neal the report was accepted.

Mr. Mutz moved that a Committee be appointed to redistrict the State.

Mr. Gilbert. We have no time to redistrict the State at this meeting. I think it should be referred to the Committee and report on it in next January.

Dr. Brown. The Committee on redistricting the State can report at the next session of this Board, but it can be of no avail until we have another election. It would be as well for it to report twelve months hence as to report sooner, as we could not act upon the report.

Mr. Gilbert. It is necessary that it should be done as early as possible. It will be delayed at least one year if left until next year.

President Lockhart. I will shortly appoint this Committee, and they can divide the State as they see best. If they see fit to refer it to the Board proper they can do so.

Mr. Ragan. The question is whether this body shall act upon this subject now or defer it one year.

The following Committee was appointed to redistrict the State, to-wit: Messrs. Mutz, Mitchell, O'Neal, Jones and Hargrove.

Concerning the recommendation of the committee that the delegates from Rush and Tippecanoe counties be a committee to present resolutions expressive of the sense of the Board relating to T. V. Mitchell and H. T. Sample deceased, it was explained that resolutions of respect to the memory of Mr. Mitchell had been passed at the February meeting, when on motion Mr. O'Neal, delegate from Tippecanoe County was appointed the committee, in compliance with the recommendation relating to the decease of Henry T. Sample.

Messrs. Mutz, Mitchell and O'Neal of the Board and Messrs. Jones and Hargrove of the delegates, were on motion appointed to carry out the resolutions of the special committee on President's address.

Governor Porter then addressed the Convention as follows:

GOVERNOR PORTER'S ADDRESS.

I appreciate much the honor of having been invited to address you. You are charged by law with the highly important duty of meeting here annually, "to deliberate and consult upon the wants, the prospect and condition of agriculture in the State." No more important subject could occupy your attention. You have done much for our agriculture. From the great importance of the matters which you consider—so vital to the interests of the State—one might well expect that, instead of meeting in this contracted hall, the largest hall in this city would scarcely be capacious enough to hold the eager listeners drawn together to hear your discussions.

It seems to me that much additional interest might be imparted to your deliberations, if you were able to avail yourself at your annual meeting of the facts and suggestions which should be contained in the reports required by statute to be made by the county and district societies, with regard to the condition of agriculture in the several counties and districts. They are now not delivered to you until the day you meet, and for any practical use at your meeting they might as well not be made at all They go into the annual report of your proceedings, where, from having excited no discussion, they are little read, and they are much less carefully prepared than if they were written to be read by you before the period of your meeting, and were to form a topic of investigation and discussion. The statutory requirement is not fulfilled, according to the intention of the legislature, by a mere general report that the crops of the county have been good, or that one crop has been a full one and another a short one, but the report should go into details, showing such things as the acreage of each crop, the mode of tillage, the changes and improvements, whatever they may have been, of methods, the effect of underdraining, where it has been practiced, and of denuding the soil of timber, where this has taken place to any large extent, and other matters which will occur to you as not less important, in order to exhibit intelligently the condition of agriculture. To facilitate this work and to insure that completeness of information which is so desirable, it seems to me that it would be wise to direct your secretary to prepare and cause to be printed a series of questions, answers to which would furnish accurately the chief part of the knowledge wanted, and to send these printed questions to the several county and district societies. I have ventured to prepare some of the questions which it seems to be proper to propound, not particularly for adoption, but as a better method of conveying my own views. [Here the governor read the questions.] The reports of these societies should be required by law to be delivered to the secretary, at least a month before your annual meeting, so as to give an opportunity to the several members of the State Board to inspect them before the meeting; and the secretary should be required to furnish to the board an abstract of these reports, and to bring to its special attention all suggestions and facts contained in them which may seem to him to possess any new or particular interest. Furnished with reports from the several county and district societies, so complete and instructive, your discussions would be invested with a much increased attraction.

The Agricultural College of the State—Purdue University—should be brought in very near relation to this Board. An additional interest would be given to your proceedings by inviting to your annual meetings, to remain with you during your whole session, the President and the Professors of Chemistry and Agriculture of this University, and also the State Geologist and the Chief of the Bureau of Statistics. They should be invited to give all the information in their possession which they may deem of value, regarding agriculture in the State, and the means by which it can be improved and benefited. Their time during the whole year being devoted to an investigation and ascertainment of facts having a near relation to agriculture, they should be urged to take part in your discussions and should be freely interrogated with respect to all matters of interest which ought reasonably to come within the scope of their studies. The discussion thus aroused would excite general attention and would impart to your meetings much additional spirit. It seems to me that it would be most proper that the officers mentioned should be made by law members *ex-officio* of the Board.

The annual report of Purdue University, and of the State Geologist, and of the Chief of the Bureau of Statistics, should be printed and copies distributed to the members of this Board at least a month before your annual meeting. We must do what we can to have this done hereafter.

Every occupation is liable to become monotonous and prosaic to those who practice it. It should be invested, in order especially to please the young, with whatever will charm the imagination. Let the farmer's son be touched with a fondness for nature akin to that which animates the poet as he depicts its abounding wealth of varied beauties, and it will give him a new zeal in his occupation. While exalting the soul it will not be without a commercial value also. He will not be less prosperous while learning to draw delight, as from a perpetual fountain, from the objects which meet his view whenever he looks over his fields. In discussing the subjects which concern the agriculturist, you will do well to lend to his occupation not merely the help of facts and science, but to invest it with whatever new attractions will please the imagination.

I feel, gentlemen, that these meetings, on account of the great importance of the subjects discussed, should not seem so much less to engage public attention than your fairs, which are so successful. And I am sure that you can not be less impressed than I am with the importance of making them the means of interesting the people more and more in agriculture, and of disseminating among them new and valuable knowledge.

On motion of Mr. Ragan, a rising vote of hearty thanks was accorded the Governor for his address.

DISCUSSION.

Mr. Seward. I had the honor of making the annual report of this Board to the Legislature, when I was an executive officer, and called attention to the fact that the State Board when first organized, was so done under a direct law. I at the same time called attention to the fact that we had no available statistical information. The law making the State Geologist an officer of statistics was a most unhappy wedding. This was seen after working a year and the last Legislature divorced this combination, and established a Bureau of Statistics. The statistics of the products of Indiana should be a part of the business of the State Board of Agriculture, or in other words, it should be made a Bureau of Statistics. I suggest that Governor Porter be asked to use his influence in this connection with the next Legislature.

On motion of Mr. Seward, Governor Porter was requested to recommend to the Legislature at its next session, that the Bureau of Statistics be incorporated into and made part of the duties of the Board of Agriculture.

Mr. Jones. I am in favor of having those statistical reports made monthly, that we may know the condition of the growing crops of the country. They can well afford to give us such reports. I move that the Secretary be directed to request of consulates of foreign countries, their monthly published statistics or reports of crop prospects, or as often as published. Carried.

Mr. Meredith. In Ohio they are holding agricultural institutes in different parts of the State each year, which are doing much good toward helping to bring out that statistical information which has been so highly complimented and valuable for reference.

Professor Ingersoll. I had the honor of meeting with the first agricultural institute among the farmers in the United States. The State Board of Michigan was the originator of the idea, and in 1875 they commenced holding meetings in such places as the people should desire in the way of an experiment, which has proved very satisfactory. The States of Ohio and Illinois took this subject up and said they would hold institutes from two to four weeks long, at which they would give lectures to local bodies in the State. This has been the Ohio plan up to this year, but this year Ohio has adopted the Michigan plan.

Dr. Allen Furnas offered the following:

Resolved, That it is the sense of this delegate Board, that the State Board should create an Agricultural Institute to meet once a year, to remain in session from ten days to a fortnight, for the discussion of matters pertaining to agricultural and kindred subjects.

Which, on motion of Mr. Jones, was referred to a committee of three, to be appointed by the President.

Messrs Jones, Seward and Sutherland was appointed the committee.

Mr. Seward. In the section of the State where I live, the soil is underlaid with limestone. We have been using lime as a fertilizer. I wish to ask if the experiment has been tried in any other part of the State. The result on corn this year was not so marked on account of drought, yet ordinary limestone was equal to bone dust, ashes or stable manure. We kept an accurate record of the time and results, and as I said before, limestone fertilizer was equal to the best. It costs almost nothing, only the mining where it abounds. It has been tested in Pennsylvania, but not thoroughly tested in Indiana. I hope that farmers will take sufficient interest in it to test it in different parts of the State. We tested it on cabbage and they were better than those on which none was used.

Governor Porter. How do you pulverize it?

Mr. Seward. This was pulverized as taken from the quarry. They have appliances by which it may be pulverized sufficiently fine. That which I used was not pulverized as well as it should be, yet it answered the purpose well. I think this is an important subject and one to which we should pay some attention.

On motion of Mr. Blessing, the questions suggested by Governor Porter, were submitted to a committee of five, appointed by the President, who named Messrs. Blessing, Chamberlain, Latta, Dungan and Seybold.

Mr. Sutherland. I have listened with a great deal of interest to the Governor's address. I feel that he is like what he said of Prof. Collett, he is radiating with knowledge. I hope that some such scheme as the Governor presented will give us better reports. At present it seems difficult to get reports. I am a delegate here authorized to come as our President, yet we have no report here. I am at a loss to know how to prevent this way of doing business.

Gov. Porter. All county societies are required by law to make out their reports in accordance with rules and regulations of the State Board of Agriculture, and no subsequent payment can be made from the county treasury to them unless a certificate is presented to the Auditor from the Secretary of the State Board, showing that such reports have been made. The State Board thus seems to have great control with respect to these reports.

On motion of Mr. Latta, the Board was requested to recommend to county societies to offer premiums for the fullest and most complete reports for the coming year.

Board then took recess until 1:30 o'clock.

AFTERNOON SESSION.

Board met, President Lockhart in the chair.

Mr. Mitchell, from the Committee on Credentials, reported that John L. Jones, of Bartholomew county; R. P. Haynes, of Daviess county, and Samuel Hargrove, of Pike county, are entitled to seats as delegates from their respective societies.

Your Committee would respectfully suggest that some positive rule be adopted by this meeting for the admission of delegates to seats as voting members in the future, giving public notice of it and living up to it.

ROBERT MITCHELL,
JOHN MCDONALD,
JOHN BLESSING,
Committee.

Which, on motion of Mr. Gilbert, was concurred in.

On motion of Mr. Byers, Mr. Sunman was permitted to represent Ripley county in the Convention.

DISCUSSION.

President Lockhart. There should be some way in which to impress upon county and district societies the necessity of being prompt in sending in their reports. Their failure to do so places our Secretary in an embarrassing position.

Mr. Byers. I indorse the remarks of President Lockhart. Our Secretary promised to have the report from our county in readiness for me to bring down, but failed to do so. You see it is negligence on the part of the Secretaries. They should make out their reports and file them here by the first of the year.

Mr. Ragan. I have always felt that a member of the Board proper should not be a delegate. I have frequently declined to represent Hendricks county in that way. If our people have not interest enough to send a delegate to represent them on the Board, they should not ask me to participate in the election, as I am a member and eligible to participate in the discussions, but not in voting except as a delegate.

Mr. Barns. In all cases counties should be ruled out where they do not file a statement.

President Lockhart. I do not think it would be any injustice to do so.

Mr. Haynes. When Daviess county was called, I failed to answer, for the reason that I had no report. I failed to see our Secretary on account of high water, consequently am here without a report. Several others are in the same fix, yet we are allowed a representation. If others are permitted a representation without a report, I ask to represent my county.

Mr. Ratliff. I am here as a proper delegate from our society, but have no report. Am I to be debarred from the privilege of voting through the negligence of our Secretary?

President Lockhart. The President of any county organization has a right to cast a vote; but if any one comes here without authority from the President of his local society, he has no right to cast a vote.

Mr. Mitchell. Being President, Mr. Ratliff is a rightful delegate. If the report is not in, is he to be debarred through the carelessness of the Secretary? We do not want to shut the doors, but build up and increase the interest of agriculture in the State.

Mr. Ragan. There are grave questions of law in this matter. This body has no authority to create a delegate in my estimation. It has the power to demand of the various societies that their representation should be accompanied by those reports. The law makes the President a delegate by virture of his office, and also gives him discretion in the event that if it is not convenient to be present, to appoint a proxy.

The Delegate Board then proceeded to the election of members of the Board proper, to fill the places of members whose terms expire with the close of this session, which resulted as follows:

1st District—Robert Mitchell	Gibson county.
2d District—Samuel Hargrove	Pike county.
3d District—B. H. Hancock	Washington county.
4th District—W. B. Seward	Monroe county.
7th District—S. W. Dungan	Johnson county.
14th District—L. B. Custer	Cass county.
15th District—W. A. Banks	Laporte county.
16th District—R. M. Lockhart	DeKalb county.

President White of Purdue University, delivered a short address on the work of that institution, which will be found in this report.

Dr. L. G. Curtis followed in an elaborate paper on "Air dust, what is it and its effect on man and beast," which is to be found in this report.

Professor Ingersoll delivered an address on "Our Agricultural College Work," which will be found under essays in this volume.

Mrs. Dr. Campbell read from advance sheets of the report of Chief Conner, of the Bureau of Statistics, relating to the employment of women in Indiana; but owing to a lack of reports from some of the largest counties, it was not deemed advisable to publish a partial report.

Each of the preceding papers was accorded a hearty vote of thanks and request made for their publication in the annual report.

The Board then tcok recess until 7:30 evening.

EVENING SESSION.

Board met, President Lockhart in the Chair.

Hon. J. B. Conner, Chief of Bureau of Statistics, read an essay on the subject of statistics, which will be found elsewhere in this volume, together with discussions thereon.

Following this, Hon. W. H. Ragan read a paper on "Cultivating the Black Walnut," which, together with discussions thereon, will be found elsewhere in this volume.

Mr. Jones, of the special committee to whom was referred the resolution of Dr. Furnas relating to Agricultural Institutes, reported as follows:

That after due consideration we unanimously recommend:

First. The holding of four Institutes as a trial in this State—two to be held this winter and two in the month of December, this year.

Second. That the Secretary of this Board be authorized to receive proposals from different localities in the State for such Institutes and have the power to make appointments.

Third. That the town or locality expecting such Institute must pledge itself to defray the expenses of such Institute, including the providing of a suitable hall well warmed and lighted; and further, that the locality furnish at least one-half the papers on the program.

Fourth. That the State Board of Agriculture ask of the Trustees of Purdue University that they send at least two of the Faculty of that institution to attend each Institute and lecture or read papers.

Fifth. That such Institute hold two days with four or five sessions, as circumstances may seem to dictate.

Sixth. That the Secretary of this Board, with a local committee at the place of holding such Institute, be empowered to make up the program for that special occasion.

Seventh. We further recommend that the Legislature be memorialized for a special annual appropriation of $500 for the holding of Agricultural Institutes for the education of the farmers of our State.

AARON JONES,
JOHN SUTHERLAND,
W. B. SEWARD,
Committee.

DISCUSSION.

Mr. Meredith. It would be more desirable to have those institutes at some other time than in the fall. At that time we have the fairs, and immediately after that comes corn husking. The best attendance we have at our local associations is in the spring or during the summer. We have meetings in Wayne county, where several hundred attend.

Mr. Jones. The kind of meetings the gentleman speaks of over in Wayne county, is somewhat different from the meetings contemplated by this committee. The meetings of Michigan are held in December and February. The farmers as a rule have more time to give to this work in the winter than in the summer.

Mr. Sutherland. We wish to have two institutes this winter and two next winter, before the meetings of the Legislature. We want a little assistance from the Legislature in holding such institutes.

Mr. Jones. We expect the local societies to defray the traveling expenses of the officers of Pudue University in attending these trial trip meetings. After that we hope the Legislature will cover the expenses. We believe it will be one of the best educational institutions in the State. Living where I do, on the border of Michigan, I have attended some of their meetings, and I am convinced of the good they might do. They have created in different localities, institutes which are the outgrowth of their State institution. We thought that if Indiana would this year hold a few meetings of this kind, and if they prove to be beneficial, we would ask the Legislature to appropriate $500 for this purpose.

Mr. Meredith. Purdue University comes before the people every year for an appropriation. It is a part of the duty of the Professors to attend those meetings. We can not go before the Legislature and ask them to extend an appropriation for our institution without a great deal of hot discussion. It was almost equally divided on the ayes and nays when we asked for our appropriation at the last session. It was asked why are we using so much money?

Mr. Kirkpatrick. If we take this matter to the Legislature, it seems to me we will endanger the cause. I would like to strike out that clause of $500.

Mr. Ragan. We had better undertake this matter on our own responsibility, for a time at least. I would suggest that the request of $500 be left out for the present, and see how we get a long, and in the mean time if we think it is necessary, then let it come in.

Mr. Mutz. I am astonished while listening to these discussions. You are all aware that the reason why agriculture stands where it is, is because we have been too modest to ask. Gentlemen get up here and talk about $500. The great agricultural interest of the State of Indiana, should not be afraid to ask for $500 to assist in this great work. Talk of public utility, talk of the pitiful sum of $500 in this connection, its a mere nothing; if you want success make it $1,000 instead of $500, and you will get it when the object is understood.

Mr. Ragan. We have one year before the next meeting of the General Assembly, and we must run these institutes on our own resources this year. If we make them a success by our own efforts, we can then with impunity ask for the appropriation from the Legislature.

Mr. Sutherland. You can not run an institution of this kind without some expense. We have given thousands of dollars to our State educational institutions. Who is this asking for this $500? We want to get up something by which we can be educated. I have grown up here, and had no chance of an agricultural education, only as I picked it up, such as being at these agricultural meetings, State Fairs, and my experience on the farm, but here is a chance in which I can go and get some information on this subject. Five hundred dollars is a small thing for this Board to quibble over. We should not be backward, but go to the Legislature and tell them what we want; and why we want assistance.

President Lockhart. Secretary Chamberlain, of Ohio, holds such meetings in that State. They don't hesitate to go into the Legislature and ask for money for that purpose.

Mr. Sunman. Did the Ohio people ask for this money before they tried holding institutes, or did they wait until after they had given it a trial?

President Lockhart. They pay their Secretary $2,000 a year, and give him an assistant with a salary of $1,500, and after all that, still offer assistance that he might work this matter up over the State. They asked for an additional sum for holding those institutes, and got it.

Mr. Kirkpatrick. Let those who were in this institution a few years ago talk of $500 and $1,000. When the mortgage was likely to close in on us, and we got little or no satisfaction out of the Legislature, and two of our members were of that body. I took it that the feeling with that body was that the property might be sold, rather than try to continue the fairs, if not self sustaining.

Mr. Mutz. I was a member of the State Board at the time referred to. The Delegate State Board voted us into that enterprise, and it was submitted to the Delegate Board before the State Board would touch it.

Mr. Meredith. Did not Governor Williams favor such a movement?

Mr. Jones. It occurs to me that we have been misunderstood. It is not the State Board that is getting this appropriation, it is a fund for the education of farmers, and only held in trust by the State Board. It is not in any way encumbered, but is for the farmers of Indiana. I apprehend after institutes have been held a few years we can go to the Legislature, and ask treble that amount for the education of farmers in the way we propose, and it will be granted us.

The report was accepted and the recommendation adopted.

Mr. Gould, of the Committee on the Geological and Natural History Department, reported as follows:

Your Committee appointed from the Delegate Board to report to this Board in regard to so much of the President's address as relates to the geological fund and the disbursement of the same, submit the following: Great credit is due Professor Collett for the manner in which such moneys have been expended in the past year and for the fine method of display and the practical arrangement of the collection under his care, and important additions made to the same, which has already given this collection a prominent place among the scientists of the world for completeness in many important features as well as for practical usefulness; that we can not better show our appreciation of such service than to continue the same discretion in the further use of the geological fund for the ensuing year as in the past, and that the balance shown in said report to be still on hand be reserved for such purposes, to be so expended with the concurrence of the State Board in the future.

VERNON GOULD,
JASPER N. DAVIDSON,
Committee.

The report was accepted and the recommendations therein adopted.

Mr. Blessing, from the committee to whom was referred the questions suggested by Governor Porter in his address, reported as follows:

After examination of the interrogatories suggested by our distinguished Governor, we feel unable and incompetent to improve them; therefore, we recommend their adoption, with the additional suggestion made by Dr. Chamberlain, to-wit: "The condition of our public highways and the best way to improve them."

We further suggest that if these questions meet your approval, sufficient copies thereof be printed at once to supply each county association and township, together with recommendations of the State Board regarding the effect of a special premium

for the best and most elaborate answers to these questions, and that the answers be forwarded by the Secretaries of each County Agricultural Society to the Secretary of the State Board by the 1st of December, 1882.

JOHN BLESSING,
Chairman.

Board then adjourned until 9 o'clock to-morrow morning.

MORNING SESSION.

THURSDAY, Jan. 5, 1882.

Board met at 9 o'clock P. M., President Lockhart in the chair. Members all present. Minutes of all the previous sessions not heretofore read were read, corrected and approved. After which followed a discussion on

REDISTRICTING THE STATE FOR AGRICULTURAL PURPOSES.

Mr. Mitchell. In redistricting the State the question is, whether we shall make a district of Marion county. If we make this a district they will have a chance hereafter as members of the delegate Board, and take part in the deliberations of this body. It might have a good influence in regard to holding the State Fair.

Major Wildman. I feel an interest in this matter. I have taken pains to see the business men of Indianapolis on this subject. At the time of the building of Exposition Hall there was not a good feeling existing between the Board and the business men of the city. I am satisfied there is a better feeling now than has existed for the last six or seven years. Since last fall there have been several meetings held among them, and the Board of Trade has met for the purpose of canvassing and looking after the best interest of Indianapolis, and what would be for the best interest of the city would also be for the best interest of the State. You have a committee appointed to redistrict the State, and I believe the members of the State Board and Delegate Board can not see why the county of Marion should not be a district of itself. This can not be done now, but it can at the February meeting. Why not let one of their number act in connection with the State Board as advisory in preparing a premium list for the next Fair. Of course they can not vote. It will interest the people of Indianapolis, and induce them to extend more aid in carrying on the work.

Mr. Quick. I do not think it would be doing the Delegate Board justice to attend to this matter of redistricting next February. This committee should take their time in making out their report, and this Delegate Board should have something to say when this report is handed in. They should have a right to help discuss it.

Mr. O'Neal. All the difficulty can be obviated by having a member of the Board from this dsitrict ushered in at the February meeting. I move that we reconsider the resolution.

Mr. Conner. It seems to me that the correct view of this matter would be that if this committee could report at the February meeting, the State Board should take action conformitory of that committee, recommending it to the next Delegate Board, which Board would then feel that they had some voice in the action of the State Board. You will then have that which you are seeking in the business men of the State. Let it be understood that it is desirable to make a district of Marion county, and I think we will enlist the interest of the business men on this subject.

Major Wildman. I am satisfied that the efforts being made to make this county a district of itself will have a tendency to create a good feeling between its citizens and the Board.

Mr. Gilbert. When this subject was up, I was in favor of giving it to the Board proper to consider. There is not one-half of the delegate members present, and it would not be right to decide this in their absence.

Mr. Sutherland. I am of the same opinion as Mr. Gilbert. If we had made arrangements to refer it to the Board proper, it would be all right, but now as a large number of the delegates are out, for us to take it up now, would look like a set up job. We have had this thrown up to us that we are running this institution ourselves. We do not want to do anything that will give reason for this assertion.

Mr. Ragan. This Delegate Board could not make the change contemplated. It is the business of the Board proper to put in action what the Delegate Board should suggest. We have the wish of the Delegate Board in this matter, and it now remains for this Board to act in the case at the February meeting. It is undoubtedly a matter of considerable consequence.

Mr. Hancock. I think we should pay some respect to the Delegate Board. A large number of the delegates have gone home, and for us to put this through in their absence would be doing them an injustice. I can not support the resolution.

Mr. Hargrove. This question was fully discussed when the resolution was introduced before the Delegate Board. I was in favor of the Board proper making a report at the February meeting, but the Delegate Board wanted to have something to say in the matter. It seems to me after having taken the subject under consideration yesterday, we should look to their interest, and try to suit them as much as we can. There is some feeling against the State Board, and if we do any thing of this kind, it will make the enmity greater.

Mr. Kirkpatrick. After considerable discussion on this subject, I think it the best thing to leave this matter alone. Our purposes are fixed, and the people of Indianapolis will see that we want to accommodate them. We must show that we are going to act fair with all parties of the State. The best thing we can do at present is to lay this resolution on the table.

Mr. O'Neal from the committee appointed to draft resolutions expressive of the sense of the Board, relative to the decease of Henry T. Sample, presented the following:

WHEREAS, The inscrutable hand of death has again invaded our numbers. The familiar face of Henry T. Sample will not be seen more at our annual gather-

ings. He has passed from life unto death by that dark and mysterious route that we too, soon must travel. He was gathered like grain ready for the sickle, full of years and justly merited honors. His faithful and watchful care over the interests of this Board for a long series of years will entitle him to a first rank on its roll of honor.

As a feeble tribute to his memory, and as an earnest of our own high esteem, be it

***Resolved*, That a record of his death be spread upon the journal of this Board.**

Which on motion of Mr. Kirkpatrick, was adopted, and the Secretary directed to transmit a copy thereof to the family of deceased.

Mr. Sutherland. I have known him ever since I was a boy; he was one of the best men that I ever made the acquaintance of. There was no man on this Board for whom I had more respect. He tried to do just what was right. I can bear testimony to those noble qualities so prominent in the history of his life.

Mr. Ragan. It was my fortune to become a member of this Board at the same time he was. We served together eight years, and our relations were of the most pleasant character possible. The more I knew of Father Sample, the more I appreciated his real worth. There are few men with whom I have served in a public capacity, that I have not felt at times that they were actuated with more or less selfishness; Father Sample was an exception. I have never known him to be other than sincere and candid. There can be no other thought entertained on my part. While in Lafayette, I called on him when on his death bed. He introduced me in his feeble dying moments to his sons and daughters and grandchildren. I never witnessed a more affecting scene.

Mr. Mitchell. I feel that he was indeed a father to me in the way of advice. Last fall I was at Lafayette, and observed that the people there appreciated that man, and still retain his old hickory chair (presented by friends many years ago) in its usual place where the meetings of the Board were held, over which he presided for so many years. I feel to-day that we should strive to emulate him.

Mr. O'Neal. He was a man beloved by all. He was one of the first settlers, and had something to do for the entire population. He seemed to be entirely free from selfishness. He would often forget himself in his anxiety to do good for others. His anxiety did not seem to be for the influential part of the population, but it was for the lowly, the poor and the friendless. When he died, he died without an enemy in that entire locality.

Mr. Meredith. I was in the city of Indianapolis a few years ago when a boy, at which time I met with Mr. Sample. He asked me who I was. When told, he seemed to be very much interested, as he was a warm personal friend of my father. Ever since that time I have felt a deep interest in him. He was a good man—one of the best. It was the mission of his life to encourage every one. I think that he was truly a good man in all that can be said, and, in the language of one, "his face was a benediction."

Professor Edwards, of Colorado. The name calls up memories of the past to me. I have not lived here since 1857. In 1844 I was a citizen of Lafayette. The children of this man were my schoolmates. The name of Sample was an honored name then. I take pleasure in throwing tribute over his name.

BIOGRAPHY.

By J. K. O'Neal, of Lafayette.

Henry T. Sample was born near Middletown, Butler County, Ohio, on the 29th day of September, 1805. A few years after his father moved to Colerain, on the river Big Miami, thence to Randolph County, Indiana, in the year 1818.

His first lessons in commercial enterprise were learned in shipping the products of his father's mill and farm down White river and selling to settlers located on lands purchased from the Indians, on part of which the capitol of Indiana now stands. After that trade was supplied, he hauled the products north to the Mississinewa river and there traded with the Miami Indians, and on the Wabash as far down as Lafayette. His first trip to Lafayette was in the year 1825, which had been laid out only one week before his arrival. In 1822 he began an apprenticeship in the tannery and currying business in Randolph County.

In 1826 he married Miss Sarah Sumwalt (who yet survives him) and moved to Lafayette, Indiana, and embarked in the tanning business. In 1833 he began to slaughter and pack hogs in connection with his tannery. In 1842 the late Joseph Hannah was associated with him and the firm of Sample & Hannah constituted one of the most considerable beef and pork packing establishments then in the West. New Orleans was their principal market and was reached by flat boats. This proved to be very profitable for a succession of years and made Mr. Sample a very wealthy man. His wealth had, every dollar of it, been acquired honestly and not as is so often the case by tearing others down, but by helping to build all up, and lending a willing hand to every worthy enterprise. The confidence reposed in him by all classes, especially the farmers and stock raisers with whom he had most to do, was unbounded. In times of panic men have been known to carry his check for months in preference to the certificate of any bank, they insisting that they felt safer with the promise to pay of that plain man, H. T. Sample, than one signed by any array of bank officials. He was the friend of all, but especially of the poor man; having come up from the humble walks of life, his sympathies naturally drifted to the worthy man struggling with difficulties, and to this class he was ever ready to lend a helping hand.

In the year 1858 he purchased and improved a large tract of land in Benton county. As a tiller of the soil he found more pleasure than in any occupation he had heretofore engaged in. Having become deeply engrossed in farming operations, the necessity of awakening the farmers of Tippecanoe county and the Wabash valley to a better cultivation of their farms and an improvement of their stock strongly presented itself to him, and from his exertions grew into life the Tippecanoe Agricultural Association, the most successful in the State, if not in the entire west. Its success is due to the devotion, care and wise counsel of Henry T. Sample. He was its beloved and honored President from its organization until his death, a period of thirteen years. Its usefulness to the agricultural interest of the Wabash valley is incalculable, and of itself will prove a monument to his memory more enduring than that of brass or stone.

In 1873 he was chosen a member of the State Board of Agriculture, and here as in all former positions of honor, he took front rank. His counsel was eagerly sought by his fellow members and his suggestions always found to be eminently proper. At the annual election of the State Board, January, 1881, feeling the weight of advancing years, he declined a re-election and bid adieu to the Board. In a few days after he was taken sick and after much suffering, which he endured with all the resignation of the true Christian, which he was, expired February 19, 1881. And thus has gone, in many respects, one of the most remarkable men of our State and times. His triumphs were not those of the warrior, but rather the more enduring one of peace and patient industry. He had seen his State grow from a wilderness to the position of one of the proudest commonwealths of the nation, every step of whose progress had been marked by his hand. He had merited and received the love and respect of countrymen to an extent rarely accorded to man, and now full of years and well merited honors, resting majestically at the foot of that mighty pyramid of industries which he had so generously helped to rear, he gently passed away.

On motion of Mr. Quick, Mr. Lockhart was excused from reading his essay on fences, and requested to furnish it for publication in the annual report.

Mr. Custer read a paper on the running at large of animals, which will be found elsewhere in this report.

On motion of Mr. Davidson, thanks were tendered to Mr. Custer for his paper, and a request made for its publication in the annual report.

On motion of Mr. Ragan, Mr. Conner, of the Bureau of Statistics was appointed a delegate to the convention called by the United States Commissioner of Agriculture to meet in Washington, January 10, 1882.

On motion of Mr. Jones, Mr. Robert Mitchell was also appointed a delegate to the same.

Mr. Ragan moved to add Mr. R. P. Haynes to the list of delegates.

Mr. Gilbert moved to amend by referring the matter of appointing delegates to that convention to the Board proper, which was agreed to and the matter so referred.

Mr. H. C. Meredith read a paper on Sheep Husbandry in Indiana.

On motion of Mr. Sutherland, thanks were returned for the same, and request made for its publication in the annual report.

The papers will be found under the head of Essays in this volume.

President Edwards of the Colorado Agricultural College was introduced to the convention, and spoke in substance as follows:

I am not prepared to say much on this occasion, having but just arrived in your city. Colorado is generally thought of as a mining State, but there is a large belt of fine land that we can claim, which is from forty to one hundred miles from the foot hills of the mountains, and is the richest land in the United States. For some purposes it is better than for others. Our average of wheat last year ranged from twenty to twenty-five bushels per acre. In our College we have an experimental department. Professor Blount who represents the College and State at Washington, has one hundred and forty-five varieties of wheat on which he has been making some experiments. Our soil is good and we can grow winter wheat to pretty good advantage, but spring varieties are best. The county which took the premium at the fair last fall is a black, sandy soil. Professor Blount has made some hybrids within the last few years, and for those varieties he has been offered as high as $60 per bushel for seed wheat, but we do not throw it upon the market, as the State will utilize all this again. We purpose establishing three farm stations representing the different climates of the State. These will be for the accumulation of stock to be sold to the farmers, and for the best kinds of wheat. We perhaps have some advantages over the older States in relation to the Agricultural Colleges. The Agricultural Colleges of Indiana, Michigan and farther east have gone over the field, and have improved varieties, and do not stand so much in need of an experimental department as we do. The soil is new, and the climate is new. Irrigation is new to you here. The State furnishes the means for this work, and every thing that pertains to the agricultural development of the State. We are making the desert to blossom as the rose, and the green grass grows where there was only sand and prairie dogs.

Mr. Johnson. Does your wheat belt depend upon irrigation, or only in part?

Professor Edwards. It depends entirely upon irrigation. We never suffer from wet or drought. We irrigate every year just what we want. We never suffer unless the grasshoppers come down upon us.

A vote of thanks were tendered the Professor for his remarks.

The Secretary read a letter from President F. A Friedley of DePauw College, regreting that on account of sickness in his family, he could not be present at the Convention, and take part in its deliberations.

Mr. Davidson offered the following:

Resolved, That the sympathies of the Delegate Board be tendered to President Friedley in his domestic affliction. We had looked forward with interest to the reading of his paper, "Education necessary to successful farming," which the Secretary is instructed to request of him for publication in the annual report.

Adopted.

Mr. Lockhart presented a paper from J. E. Thompson of Waterloo, on "Food Supply," which, for want of time, was not read, but was requested for publication in the annual report, and will be found elsewhere in this volume.

The Delegate Board then adjourned *sine die.*

PRIZE REPORT.

The Board in session at the February meeting 1882, appointed a committee to examine and award the premium of a Silver Medal, for the best annual report for 1881, for the County and District Agricultural Societies. The decision to be based on style, condensation, variety of matter, and giving the comparative condition of agriculture.

The Committee made the following report:

Your committee appointed to examine the County and District Agricultural Society Reports of 1881, on file in the office of the Secretary, beg leave to report, that we have performed that duty, and award the premium medal to the Knox County Agricultural Society.

There were several other reports in close competition, and deserving of special mention, as the report from Lake county, Whitley county and others.

Respectfully submitted,

ROBERT MITCHELL,
W. B. SEWARD,
T. M. KIRKPATRICK,
Committee.

INDIANA STATE FAIR.

PREMIUM AWARDS 1881.

HORSES.

ROBERT MITCHELL, Superintendent.

CLASS I.—Heavy Draft Horses.

(When State is not given, Indiana is implied.)

Stallion, 4 years old and over, Cal. Bates, Falmouth, Fayette Co	$40
Second premium, W. W. Isenhower, Whitestown, Boone county	20
Stallion, 3 years old and under 4, Wm. Houston, Lewisville	30
Second premium, S. R. Quick & Son, Columbus	15
Stallion, 2 years old and under 3, Robert Bogue, Fairmount, Grant county	15
Stallion, 1 year old and under 2, Robert Bogue, Fairmount, Grant county	10
Second premium, Ezra Reed, Hope, Bartholomew county	5
Mare, 4 years old and over, colt by her side, Cal. Bates, Falmouth	25
Second premium, David McKay, Chicago, Ill	12
Mare, 3 years old and under 4, Cal. Bates, Falmouth, Fayette county	15
Second premium, T. C. Linnen, Noblesville	8
Mare, 2 years old and under 3, Cal. Bates, Falmouth	10
Second premium, S. F. Batman, Carpentersville, Putnam county	5
Mare, 1 year old and under 2, David McKay, Chicago, Ill	8
Sucking Filly, Robert Bogue, Fairmount, Grant county	7
Second premium, Cal. Bates, Falmouth, Fayette county	3
Mare, 4 years old and over, regardless of having been bred, Cal. Bates, Falmouth, Fayette county	20
Second premium, David McKay, Chicago, Ill	10
Gelding, 4 years old and over, K. Munter, Indianapolis	20
Second premium, K. Munter, Indianapolis	10
Heavy Draft Teams, Cal. Bates, Falmouth, Fayette county	25
Second premium, Wm. Meikle, Pendleton	12

Committee—R. C. McWilliams, Rockville; N. P. Richmond, Kokomo; D. B. Woodcock, Lafayette.

CLASS II.—General Purposes.

Stallion, 4 years old and over, Ridlin & Norris, Petersburg, Boone County, Ky.	$40
Second premium, Gates & Pray, Indianapolis	20
Stallion, 3 years old and under 4, J. B. Irons, Potato Creek, Montgomery County	30
Second premium, W. P. Swaim & Co., Belmore, Parke County	15
Stallion, 2 years old and under 3, W. M. Heagy, Anderson	15
Second premium, R. W. Sanford, Shannondale	8
Stallion, 1 year old and under 2, J. S. Apple, Lawrence	10
Second premium, D. L. Thomas, Rushville	5
Stallion, sucking colt, J. P. Forsythe, Franklin	8
Second premium, W. P. Swaim & Co., Belmore, Parke County	4
Mare, 4 years old and over, sucking colt by side, W. P. Swaim and Co., Belmore, Parke County	25
Second premium, R. W. Sanford, Shannondale	12
Mare, 3 years old and under 4, T. C. Linnen, Noblesville	15
Mare, 2 years old and under 3, R. N. Harvey, Pecksburg	10
Second premium, Wm. Selking, Indianapolis	5
Mare, 1 year old and under 2, Phil. Herring, Brownsburg	8
Second premium, D. L. Thomas, Rushville	4
Sucking Filly, Wm. P. Swaim & Co., Belmore, Parke County	7
Second premium, J. P. Forsythe, Franklin	3
Mare, 4 years old and over, regardless of having been bred, Gates & Pray, Indianapolis	20
Second premium, E. F. Claypool, Indianapolis	10
Gelding, 4 years old and over, R. R. Rouse, Indianapolis	20
Second premium, Allen Jackson, Plainfield	10
Gelding, 3 years old and under 4, John Bradshaw, Indianapolis	15
Gelding, 2 years old and under 3, J. D. Lucas, Carlton	10
Second premium, John Marvel, Royalton	5
Pair Match Geldings or Mares, J. S. Gilbreath, Indianapolis	25
Second premium, Allen Jackson, Plainfield	12

Committee—R. C. McWilliams, Rockville; D. B. Woodcock, Lafayette; N. P. Richmond, Kokomo.

CLASS III.—Light Harness.

Stallion, 4 years old and over, W. M. Petty, Muncie	$30
Second premium, J. M. Edwards, Monrovia.	15
Stallion, 3 years old and under 4, Buck Dickerson, Greensburg	25
Second premium, D. P. Bissel, Terre Haute	12
Stallion, 2 years old and under 3, E. F. Claypool	14

Mare, 4 years old and over, colt by her side, W. M. Myers, Rock Lane	15
Second premium, Bert Myers, Rock Lane	8
Mare, 3 years old and under 4, L. J. Hockney, Edinburg	14
Second premium, J. W. Sanford, Shannondale	7
Mare, 2 years old and under 3, Frank L. Armstrong, Indianapolis	7
Second premium, Wm. A Cox, Brightwood, Marion County	3
Mare, 4 years old and over, regardless of having been bred, W. A. Jones, Rushville	17
Second premium, Allen Jackson, Plainfield	7
Gelding, 4 years old and over, E. F. Claypool, Indianapolis	15
Second premium, M. L. Hare, Indianapolis	8
Gelding, 3 years old and under 4, C. T. Allen, Smith's Valley, Johnson County	14
Second premium, Wm A. Cox, Brightwood, Marion County	7

Committee—R. C. McWilliams, Rockville; N. P. Richmond, Kokomo; D. B. Woodcock, Lafayette.

CLASS IV.—Trotting, Running and Pacing Races.

TUESDAY, SEPTEMBER 27, 1881.

RUNNERS—4 years old and over.

Green Wilson, Waldron, "Tom Montague,"	$50
Second premium, D. S. Shields, Connersville, "Robin Adair,"	30
Third premium, M. Conway, Hagerstown, "Dickey C."	20

TUESDAY.

TROT—open to all stallions.

Buck Dickerson, Greensburg, "Jim Erwin,"	$75
Second premium, Lizar & Harter, Wabash, "Blue Bull, Jr.,"	50
Third premium, M. F. McHaffie, Stilesville	25

WEDNESDAY.

TROTTERS—that have never beaten 2:40.

Buck Dickerson, Greensburg, "Jim Erwin,"	$150
Second premium, Thomas Dickerson, "Ira G."	100
Third premium, W. A. Jones, Rushville, "Florence M."	50

WEDNESDAY.

PACING—2:40 class.

A. W. Robbins, Madison, "Black Bird,"	$25
Second premium, L. P. Coble, Clayton, "Kismet,"	15
Third premium, Buck Dickerson, Greensburg, "Daisy D."	10

THURSDAY.

PACERS.

W. H. Neal, Olney, Illinois, "Flora Belle,"	$75
Second premium, P. D. McMartrie, Roachdale, "Winder,"	50
Third premium, J. H. Dawson, Frankfort, "Lady Belle,"	15

THURSDAY.

RUNNER'S—Consolation Purse.

Green Wilson, Waldron, "Montague"	$50
Second premium, George Gifford, Tipton, "Capt. Bill"	30
Third premium, Thomas Stevens, Winchester, "Long Tom"	20

FRIDAY.

FREE FOR ALL TROT.

G. W. McHaffie, Stilesville, "Frank Landers"	$250
Second premium, C. A. Forth, Evansville, "Minnie R."	150
Third premium, W. A. Hanson, Connersville, "Blanche H."	100

RUNNER'S FREE FOR ALL—Half mile and repeat.

T. H. Stevens & Wilson, Winchester, "Tom Barlow."	$50
Second premium, James, Bush, Jamestown, "Black Crow"	30
Third premium, D. S. Shield, Connersville, "Robin Adair"	20

Committee—A. W. Powell, Newcastle; D. B. Woodcock, Lafayette; N. P. Richmond, Kokomo.

CLASS V.—Saddle Horses.

Horse, gelding or mare, any age, Ridlin & Norris, Petersburg, Ky	$20
Second premium, H. B. Sherman, Indianapolis	10

Committee—R. C. McWilliams, Rockville; D. B. Woodcock, Lafayette; N. P. Richmond, Kokomo.

CLASS VI.—Sweepstakes on Horses.

Stallion, any age or class, S. Barnhardt, Thorntown	$45
Mare, any age or class, Cal. Bates, Falmouth	30
Stallion showing 3 best colts, under 1 year old, W. P. Swain & Co., Bellmore	40
Herd of six, 1 stallion and 5 mares, except heavy draft, to be owned by exhibitor, Cal. Bates, Falmouth	40
Herd of six, 1 stallion and 5 mares, heavy draft, owned by one exhibitor, Cal. Bates, Falmouth	40

Committee—A. W. Powell, Newcastle; C. Lee, Washington; Joseph H. Priest, Greencastle.

CLASS VII.—Jacks, Jennets and Mules.

Jack, 3 years old and over, Cal. Bates, Falmouth	$20
Second premium, C. W. Neal, Brownsburg	10
Jack, 2 years old and under 3, C. W. Neal, Brownsburg	15
Jack, 1 year old and under 2, G. W. Lancaster, Indianapolis	10
Mule, 4 years old and over, W. H. Glover, Clayton	12
Second premium, W. H. Glover, Clayton	6
Mule colt, C. W. Neal, Brownsburg	6
Second premium, C. W. Neal, Brownsburg	3
Pair Mules, 3 years old and over, W. H. Glover, Clayton	20

Committee—N. P. Richmond, Kokomo; R. C. McWilliams, Rockville; D. B. Woodcock, Lafayette.

CLASS VIII.—Sweepstakes.

Jack, any age, A. D. Beck, Lebanon	$20
Jack, showing 3 best colts under 1 year old, C. W. Neal, Brownsburg	20

Committee—A. W. Powell, Newcastle; C. Lee, Washington; Jo. H. Priest, Greencastle.

CATTLE.

S. R. QUICK, Superintendent.

CLASS IX.—Short Horns.

Bull, 4 years old and over, James Gaines & Son, Ridge Farm, Illinois	$50
Second premium, Thomas Wilhoit, Middletown	25
Bull, 3 years old and under 4, Thomas Wilhoit, Middletown	40
Second premium, W. H. Tresler, Bluff Creek	20
Bull, 2 years old and under 3, Thomas Wilhoit, Middletown	30
Second premium, S. Pursel, Nora	15
Bull, 1 year old and under 2, Thomas Wilhoit, Middletown	20
Bull calf, Thomas Wilhoit, Middletown	15
Second premium, G. W. Lancaster, Indianapolis	8
Cow, 4 years old and over, James Gaines & Son, Ridge Farm, Illinois	40
Second premium, Thomas Wilhoit, Middletown	20

Cow, 3 years old and under 4, Thomas Wilhoit, Middletown	$30
Second premium, Thomas Wilhoit, Middletown	15
Cow, 2 years old and under 3, Thomas Wilhoit, Middletown	20
Second premium, James Gaines & Son, Ridge Farm, Illinois	10
Heifer, 1 year old and under 2, James Gaines & Son, Ridge Farm, Illinois	15
Second premium, Thomas Wilhoit, Middletown	8
Heifer calf, James Gaines & Son, Ridge Farm, Illinois	10
Second premium, James Gaines & Son, Ridge Farm, Illinois	5
Breeding cow, calf at foot, James Gaines & Son, Ridge Farm, Illinois	40
Second premium, Thomas Wilhoit, Middletown	20

Committee—Smith Wooters, Billingsville; James W. Kay, Fredericksburg; Peter Taylor, Boonville.

CLASS X.—*Herefords and Galloways.*

HEREFORDS.

Bull, 3 years old and over, Burleigh & Bodwell, Vassalboro, Me	$30
Bull 2 years old and under 3, Burleigh & Bodwell, Vassalboro, Me	20
Bull, 1 year old and under 2, Burleigh & Bodwell, Vassalboro, Me	10
Cow, 3 years old and over, Burleigh & Bodwell, Vassalboro, Me	25
Second premium, Burleigh & Bodwell, Vassalboro, Me.	12
Cow, 2 years old and under 3, Burleigh & Bodwell, Vassalboro, Me	15
Second premium, Burleigh & Bodwell, Vassalboro, Me.	8
Heifer, 1 year old and under 2, Burleigh & Bodwell, Vassalboro, Me	10
Second premium, Burleigh & Bodwell, Vassalboro, Me.	5

GALLOWAYS.

Bull, I. B. Lutz, Lafayette	20
Second premium, Burleigh & Bodwell, Vassalboro, Me.	10
Cow, Burleigh & Bodwell, Vassalboro, Me	15
Second premium, Burleigh & Bodwell, Vassalboro, Me.	8

Committee—Dick Jones, Columbus; Peter Taylor, Boonville; James W. Kay, Fredericksburg.

CLASS XI.—*Jerseys and other Breeds.*

JERSEYS.

Bull, 3 years old and over, J. J. Scarff & Son, New Carlisle, Ohio	$30
Second premium, T. P. Haughey, Indianapolis	15
Bull, 2 years old and under 3, G. J. Stratton, Butlersville	20
Bull, 1 year old and under 2, Churchman & Jackson, Ingallston	15
Second premium, W. J. Hasselman, Indianapolis	8

Bull Calf, Churchman & Jackson, Ingallston	$8
Second premium, Garretson Bros., Pendleton	4
Cow, 3 years old and over, Churchman & Jackson, Ingallston	20
Second premium, Churchman & Jackson, Ingallston	10
Cow, 2 years old and under 3, Churchman & Jackson, Ingallston	15
Second premium, Churchman & Jackson, Ingallston	8
Heifer, 1 year old and under 2, W. J. Hasselman, Indianapolis	10
Second premium, Garretson Bros., Pendleton	5
Heifer calf, Churchman & Jackson, Ingallston	8
Second premium, Garretson Bros., Pendleton	4
Breeding cow, with calf at foot, W. J. Hasselman, Indianapolis	20
Herd, 1 bull and 4 cows, W. J. Hasselman, Indianapolis	30

DEVONS.

Bull calf, J. J. Scarff & Son, New Carlisle, Ohio	8
Cow, 3 years old and over, J. J. Scarff & Son, New Carlisle, Ohio.	20
Second premium, J. J. Scarff & Son, New Carlisle, Ohio	10
Cow, 2 years old and under 3, J. J. Scarff & Son, New Carlisle, Ohio	15
Heifer, 1 year old and under 2, J. J. Scarff & Son, New Carlisle, Ohio	10
Heifer calf, J. J. Scarff & Son, New Carlisle, Ohio	8
Breeding cow, calf at foot, J. J. Scarff & Son, New Carlisle, Ohio	20

AYRSHIRE.

Cow, 3 years old and over, T. S. Graves, Indianapolis	$20

Committee—Dick Jones, Columbus; James W. Kay, Fredericksburg; J. Q. A. Sieg, Corydon.

CLASS XII.—Fatted Cattle, Sheep and Hogs.

(No Award on Oxen or Fatted Cattle.)

Fatted sheep, T. B. Bennington, LaPorte, Ohio	$5
Fatted hogs, J. Cunningham, Miami	$5

Committee—I. C. Robinson, Kingston; T. C. Phelps, Greensboro; George Davidson, Yorktown.

CLASS XIII.—Sweepstakes on Cattle.

Bull, any age or breed, James Gaines & Son, Ridge Farm, Ill	$50
Cow, any age or breed, James Gaines & Son, Ridge Farm, Ill	50
Bull, to be exhibited with 3 of his calves, not over 12 months old, James Gaines & Son, Ridge Farm, Ill.	50

Committee—Dick Jones, Columbus; J. Q. A. Sieg, Corydon; R. G. Haworth, Liberty; Smith Wooters, Billingsville; Henry R. Pritchard, Indianapolis.

HERDS.

Herd, 5 head, 1 bull and 4 cows, or heifers, 2 years old and over, James Gaines & Son, Ridge Farm, Ill	**$100**
Herd, under 2 years old, 1 bull and 4 heifers, owned by exhibitor sixty days previous to exhibition, Thomas Wilhoit, Middletown	**50**
Herd, 1 bull and 4 cows, any age or breed, owned and bred by exhibitor in Indiana, Thomas Wilhoit, Middletown	**75**

Committee—W. W. Thrasher, Grove P. O.; Benj. S. Miller, Billingsville; Leonidas McDaniel, Rushville.

SHEEP.

H. C. MEREDITH, Superintendent.

CLASS XIV.—Fine Wool Sheep, (to include American, Spanish and French Merinos.)

Buck, 2 years old and over, Cook, Morse & Co., Raymond, Union Co., Ohio	**$14**
Second premium, Thomas Wilhoit, Middletown	**7**
Buck, 1 year old and under 2, Cook, Morse & Co., Raymond, Ohio	**10**
Second premium, U. Privet & Bro., Greensburg	**5**
Buck lamb, Cook, Morse & Co., Raymond, Ohio	**8**
Second premium, Thomas Wilhoit, Middletown	**4**
Ewe, 2 years old and over, Cook, Morse & Co., Raymond, Ohio	**12**
Second premium, Thomas Wilhoit, Middletown	**6**
Ewe, 1 year old and under 2, Cook, Morse & Co., Raymond, Ohio	**8**
Second premium, U. Privet & Bro., Greensburg	**4**
Ewe lamb, Cook, Morse & Co., Raymond, Ohio	**6**
Second premium, Cook, Morse & Co., Raymond, Ohio	**3**
Five lambs, Cook, Morse & Co., Raymond, Ohio	**10**
Second premium, Thomas Wilhoit, Middletown	**5**

Committee—Moses Butterworth, Laporte; D. M. Marlow, Adams; Thomas H. McKee, Logansport.

CLASS XV.—Leicester or Lincolns.

Buck, 2 years old and over, W. D. Privet, Greensburg	**$14**
Second premium, W. L. Scott, Scott Station, Shelby county, Ky	**7**
Buck, 1 year old and under 2, W. F. Vories, Liberty, Carroll county, Ky	**10**
Second premium, W. S. Scott, Scott Station, Shelby county, Ky	**5**

Buck lamb, W. D. Privet, Greensburg	$8
Second premium, W. L. Scott, Scott Station, Kentucky	4
Ewe, 2 years old and over, W. F. Vories, Liberty, Kentucky	12
Second premium, W. T. Privet, Greensburg	6
Ewe, 1 year old and under 2, W. D. Privet, Greensburg	8
Second premium, W. D. Privet, Greensburg	4
Ewe lamb, W. D. Privet, Greensburg	6
Second premium, W. D. Privet, Greensburg	3
Five lambs, W. D. Privet, Greensburg	10

Committee—Moses Butterworth, Laporte; D. M. Marlow, Adams; Thomas H. McKee, Logansport.

CLASS XVI.—Long Wool Sheep, Cotswold.

Buck, 2 years old and over, C. H. Ballenger, Atwater, Ohio	$14
Second premium. R. T. Vories & Son, Liberty, Ky.	7
Buck, 1 year old and under 2, C. H. Ballenger, Atwater, Ohio	10
Second premium, R. T. Vories & Son, Liberty, Ky.	5
Buck lamb, R. T. Vories & Son, Liberty, Ky	8
Second premium, R. T. Vories & Son, Liberty, Ky.	4
Ewe, 2 years old and over, W. D. Privet, Greensburg	12
Second premium, C. F. Darnell, Indianapolis	6
Ewe, 1 year old and under 2, R. T. Vories & Son, Liberty, Ky	8
Second premium, C. F. Darnell, Indianapolis	4
Ewe lamb, C. F. Darnell, Indianapolis	6
Second premium, R. T. Vories & Son, Liberty, Ky.	3
Five lambs, R. T. Vories & Son, Liberty, Ky	10
Second premium, C. F. Darnell, Indianapolis	5

Committee—Wm. A. Macy, Lewisville; J. Q. A. Sieg, Corydon; James Hollingsworth, Anderson; Perry Kesling, Onward; Thomas H. McKee, Logansport.

CLASS XVII.—Southdowns.

Buck, 2 years old and over, R. T. Vories & Sons, Liberty, Ky.	$14
Second premium, R. M. Fisher, Danville, Ky.	7
Buck, 1 year old and under 2, F. A. Byars, Simpsonville, Ky.	10
Second premium, R. M. Fisher, Danville, Ky.	5
Buck lamb, R. M. Fisher, Danville, Ky.	8
Second premium, R. M. Fisher, Danville, Ky.	4
Ewe, 2 years old and over, T. B. Bennington, Laporte, Ohio	12
Second premium, R. M. Fisher, Danville, Ky.	6
Ewe, 1 year old and under 2, R. M. Fisher, Danville, Ky.	8
Second premium, F. A. Byars, Simpsonville, Ky.	4

Ewe lamb, R. M. Fisher, Danville, Ky.	$6
Second premium, R. M. Fisher, Danville, Ky.	3
5 lambs, R. M. Fisher, Danville, Ky.	10
Second premium, F. A. Byars, Simpsonville, Ky.	5

Committee—James Hollingsworth, Anderson; J. Q. A. Seig, Corydon; Thomas H. McKee, Logansport; Perry Kesling, Onward, Cass County; Martin Worl, Jr., Hagerstown.

CLASS XVIII.—*Oxfordshire, Shropshire and Hampshire.*

Buck, 2 years old and over, G. Allen & Son, Palermo, Edgar County, Illinois,	$14
Second premium, G. Allen & Son, Palermo, Edgar County, Illinois	7
Buck, 1 year old and under 2, U. Privet, Greensburg	10
Second premium, G. Allen & Son, Palermo, Illinois	5
Buck lamb, G. Allen & Son, Palermo, Illinois	8
Second premium, T. B. Bennington, Laporte, Ohio	4
Ewe, 2 years old and over, G. Allen & Son, Palermo, Illinois	12
Second premium, T. B. Bennington, Laporte, Ohio	6
Ewe, 1 year old and under 2, G. Allen & Son, Palermo, Illinois	8
Second premium, G. Allen & Son, Palermo, Illinois	4
Ewe lamb, R. T. Vories & Sons, Liberty, Ky	6
Second premium, T. B. Bennington, Laporte, Ohio	3
Five lambs, T. Bennington, Laporte, Ohio	10
Second premium, T. B. Bennington, Laporte, O	5

Committee—I. M. Marlow, Adams; Thomas H. McKee, Logansport; Martin Worl, Jr., Hagerstown.

CLASS XIX.—*Sweepstakes on Fine Wool and other Sheep. (Fine Wool to include American, Spanish and French Merinos.)*

Buck, Cook, Morse & Co., Raymond, Ohio	$10
Buck, having 5 best lambs, T. Wilhoit, Middletown	15
Ewe, any age, Cook, Morse & Co., Raymond, Ohio	10

Committee—J. C. Robinson, Kingston; T. C. Phelps, Greensboro, Henry county; George Davidson, Yorktown, Delaware county.

LONG WOOL.

Buck, R. T. Vories & Son, Liberty, Carroll county, Ky	$10
Buck, having 5 best lambs, C. F. Darnell, Indianapolis	15
Ewe, any age, C. H. Ballinger, Atwater, Ohio	10

Committee—J. C. Robinson, Kingston; T. C. Phelps, Greensboro, Henry county; George Davidson, Yorktown, Delaware county.

MIDDLE WOOL.

Buck, U. Privet, Greensburg	$10
Buck, having 5 best lambs, R. M. Fisher, Danville, Ky	15
Ewe, any age, G. Allen & Son, Palermo, Ill	10

Committee—J. C. Robinson, Kingston; T. C. Phelps, Greensboro, Henry county; George Davidson, Yorktown, Delaware county.

HOGS.

L. B. Custer, Superintendent.

CLASS XX.—Berkshires.

Boar, 2 years old and over, A. S. Gilmour & Co., Greensburg	$14
Second premium, J. Heck & Co., Waldron	7
Boar, 1 year old and under 2, A. S. Gilmour & Co., Greensburg	12
Second premium, A. S. Gilmour & Co., Greensburg	6
Boar, under 12 and over 6 months old, I. N. Barker, Thorntown	10
Second premium, J. Heck & Co., Waldron	5
Boar, under 6 months old, A. S. Gilmour & Co., Greensburg	6
Second premium, James Riley, Thorntown	3
Sow, two years old and over, A. S. Gilmour & Co., Greensburg	14
Second premium, J. Heck & Co., Waldron	7
Sow, 1 year old and under 2, J. Heck & Co., Waldron	12
Second premium, A. S. Gilmour & Co., Greensburg	6
Sow, under 12 and over 6 months old, I. N. Barker, Thorntown	10
Second premium, A. S. Gilmour & Co., Greensburg	5
Sow, under 6 months old, D. Canaday, Frankton, Madison County	6
Second premium, A. W. Martin, Muncie	3
Five shoats, under 6 months old, A. S. Gilmour & Co., Greensburg	12
Second premium, James Riley, Thorntown	6
Sow, and not less than five sucking pigs, A. W. Martin, Muncie	12
Second premium, D. Canaday, Frankton, Madison County	6

Committee—I. C. Robison, Kingston, Delaware County; W. K. Parkson, Rensselaer; Wm. A. Macy, Lewisville, Henry County.

CLASS XXI.—Poland China.

Boar, 2 years old and over, A. E. Slaughter, South Charleston, Ohio.	14
Second premium. E. E. Elliott, Knightstown	7

Boar, 1 year old and under 2, A. E. Slaughter, South Charleston, Ohio	$12
Second premium, A. S. Gilmour & Co., Greensburg	6
Boar, under 12 and over 6 months. D. L. Thomas, Rushville	10
Second premium, A. E. Slaughter, South Charleton, Ohio	5
Boar, under 6 months, A. W. Ross, Muncie	6
Second premium, W. C. Williams, Knightstown	3
Sow, 2 years old and over, A. W. Ross, Muncie	14
Second premium, A. E. Slaughter. South Charleston, Ohio	7
Sow, 1 year old and under 2, W. C. Williams, Knightstown.	12
Second premium, J. Cunningham, Miami	6
Sow, under 12 and over 6 months, W. C. Williams, Knightstown	10
Second premium, A. E. Slaughter, South Charleston, Ohio	5
Sow, under 6 months, A. E. Slaughter, South Charleston, Ohio	6
Second premium, J. D. Webb, Rushville	3
Five shoats, under 6 months, E. E. Elliott, Knightstown	12
Second premium, W. A. Robbins & Co., Greensburg	6
Sow, and not less than five sucking pigs, A. E. Slaughter, South Charleston, Ohio	12
Second premium, J. A. Heavenridge, Liberty	6

Committee—John W. Potter, Loogootee: L. S. Harding, Laporte; D. H. Yeoman, Rensselaer.

CLASS XXII.—Large Breed Chesters.

Boar, 2 years old and over, R. S. Russell, Zionsville	$14
Boar, 1 year old and under 2, R. S. Russell, Zionsville	12
Boar, under 12 and over 6 months, J. H. McCampbell, Marshall	10
Boar, under 6 months, R. S. Russell, Zionsville	6
Second premium, R. S. Russell, Zionsville	3
Sow, 2 years old and over, R. S. Russell, Zionsville	14
Sow, 1 year old and under 2, R. S. Russell, Zionsville	12
Sow, under 12 and over 6 months, J. H. McCampbell, Marshall	10
Sow, under 6 months, R. S. Russell, Zionsville	6
Second premium, R. S. Russell, Zionsville	3
Five shoats, under 6 months, R. S. Russell, Zionsville	12
Second premium, R. S. Russell, Zionsville	6
Sow, and not less than 5 sucking pigs, R. S. Russell, Zionsville	12
Second premium, R. S. Russell, Zionsville	6

JERSEY REDS.

Boar, Emsley Wright, New Augusta, Marion county	$10
Second premium, Emsley Wright, New Augusta	5
Sow, Emsley Wright, New Augusta	10
Second premium, Emsley Wright, New Augusta	5

Committee—John W. Potter, Loogootee; L. S. Harding, Laporte; D. H. Yeomans, Rensselaer.

CLASS XXIII.—Suffolks, Essex and all Other Small Breeds, Regardless of Color.

Boar, 2 years old and over, T. B. Bennington, Lorain, Ohio	$14
Boar, under 12 and over 6 months, W. A. Maze, Sharpsville	10
Sow, under 12 and over 6 months, W. A. Maze, Sharpsville	10
Sow, under 6 months old, William Jones, Liberty	6
Second premium, J. A. Heavenridge, Liberty	3

Committee.—I. C. Robinson, Kingston, Decatur county; W. J. Parkison, Rensselaer; W. A. Macy, Lewisville.

CLASS XXIV.—Sweepstakes on Hogs.

POLAND CHINA, CHESTER WHITE, JERSEY RED, AND OTHER LARGE BREEDS.

Boar, any age, A. S. Gilmour & Co., Greensburg	15
Sow, any age, A. W. Ross, Muncie	15
Herd, 1 boar and 5 sows, of any one breed, regardless of age, size, or color, all owned by one exhibitor, A. E. Slaughter, South Charleston, Ohio	25

BERKSHIRE, SUFFOLK, ESSEX, AND OTHER SMALL BREEDS.

Boar, any age, J. Heck, Waldron	15
Sow, any age, I. N. Barker, Thorntown	15
Herd, 1 boar and 5 sows, of any one breed, regardless of age, size or color, all owned by one exhibitor, J. Heck, Waldron	25

Committee.—Peter Taylor, Boonville; Thos. Huey, Clinton; Samuel H. Snell, Walton, Cass county.

POULTRY DEPARTMENT.

R. P. HAYNES, Superintendent.

CLASS XXV.—Fowls.

Light Brahma fowls, J. B. Foot, Norwood Park, Illinois	$5
Second Premium, G. A. Danley, Indianapolis	3
Light Brahma chicks, G. A. Danley, Indianapolis	5
Second premium, I. N. Barker, Thorntown	3
Dark Brahma fowls, Julius Fishel, Hope, Bartholomew County	5
Dark Brahma chicks, Julius Fishel, Hope	5
Second premium, I. N. Barker, Thorntown	3

Buff Cochin fowls, Sid Conger, Flat Rock, Shelby County	$5
Second premium, Sid Conger, Flat Rock	3
Buff Cochin chicks, Sid Conger, Flat Rock	5
Second premium, Sid Conger, Flat Rock	3
Partridge Cochin fowls, H. C. G. Bals, Indianapolis	5
Second premium, H. C. G. Bals, Indianapolis	3
Partridge Cochin chicks, Stanford & McKee, Logansport	5
Second premium, B. F. Hill, Indianapolis	3
Pea Comb Partridge Cochin fowls, W. J. Elstun, Inianapolis	5
Pea Comb Partridge Cochin chicks, W. J. Elstun, Indianapolis	5
Second premium, W. J. Elstun, Indianapolis	3
White Cochin chicks, W. M. Meyers, Rock Lane, Johnson County	5
Black Cochin fowls, A. M. Rosencrans, Hope	5
Second premium, T. W. Pottage, Ben. Davis, Marion County	3
Black Cochin chicks, R. M. Rosencrans, Hope	5
Second premium, B. F. Hill, Indianapolis	3
Langshan chicks, Tilson & Robison, Rock Lane	3
Second premium, Sid Conger, Flat Rock	2
Plymouth Rock fowls, Sid Conger, Flat Rock	5
Second premium, Sid Conger, Flat Rock	3
Plymouth Rock chicks, Sid Conger, Flat Rock	5
Second premium, Sid Conger, Flat Rock,	3
White Leghorn fowls, Tilson & Robison, Rock Lane	3
Second premium, W. J. Elstun, Indianapolis	2
White Leghorn chicks, W. J. Elstun, Indianapolis	3
Second premium, I. N. Barker, Thorntown	2
Brown Leghorn fowls, second premium, T. W. Pottage, Ben. Davis	2
Brown Leghorn chicks, T. W. Pottage, Ben. Davis	3
Second premium, T. W. Pottage, Ben. Davis	2
W. F. Black Spanish fowls, Stanton & Gregg, Greenwood	3
W. F. Black Spanish chicks, second Premium, Stanton & Gregg, Greenwood	2
W. C. Black Polish fowls, I. N. Barker, Thorntown	3
W. C. Black Polish chicks, second premium, I. N. Barker, Thorntown	2
Houdan fowls, D. H. Jenkins, Indianapolis	3
Houdan chicks, D. H. Jenkins, Indianapolis,	3
Second premium, Stanford & McKee, Logansport	2
Golden Hamburg fowls, Stanton & Gregg, Greenwood	2
Golden Hamburg chicks, second premium, Stanton & Gregg, Greenwood	1
Silver Hamburg fowls, Tilson & Robison, Rock Lane	2
Second premium, Tilson & Robison, Rock Lane	1
Silver Hamburg chicks, Stanton & Gregg, Greenwood	2
Second premium, Dick Noland, Rock Lane	1
Black Hamburg fowls, Sid Conger, Flat Rock	2
Second premium, Stanton & Gregg, Greenwood	1
Black Hamburg chicks, Sid. Conger, Flat Rock	2
Second premium, Stanton & Gregg, Greenwood	1

Colored Dorking fowls, second premium, Stanton & Gregg, Greenwood	$1
Black breasted R. game fowls, second premium, F. W. McDougal, Indianapolis	3
Black breasted R. game chicks, D. C. Harter, North Manchester	5
Second premium, D. C. Harter, North Manchester	3
Black breasted R. game Bantam fowls, second premium, Julius Fishel, Hope	2
Yellow duck-wing, game Bantam chicks, John Conn, Indianapolis	2
Golden Seabright Bantam fowls, I. N. Barker, Thorntown	3
Second premium, I. N. Barker, Thorntown	2
Golden Seabright Bantam chicks, I. N. Barker, Thorntown	3
Second premium, Stanford & McKee, Logansport	2
Silver Seabright Bantam fowls, I. N. Barker, Thorntown	3
Silver Seabright Bantam chicks, I. N. Barker, Thorntown	3
Second premium, I. N. Barker, Thorntown	2
Rose comb Bantam fowls or chicks, Sid. Conger, Flat Rock	2
Bronze turkeys, old birds, H. C. G. Bals, Indianapolis	5
Second premium, H. C. G. Bals, Indianapolis	3
Bronze turkeys, hatch. of 1881, S. Johnson, Irvington	5
Second premium, John Marvel, Royalton, Boone county	3
White Holland turkeys, old birds, Wm. Ennis, Clermont, Marion county	3
Second premium, Wm. Ennis, Clermont	2
White Holland turkeys, hatch of 1881, W. E. Ennis, Clermont	3
Second premium, Wm. A. Cox, Brightwood, Marion Co	2
Embden geese, Wm. A. Ennis, Clermont	5
Second premium, Tilson & Robinson, Rock Lane	3
Toulouse geese, H. C. G. Bals, Indianapolis	5
Second premium, H. C. G. Bals, Indianapolis	3
Chinese geese, Tilson & Robinson, Rock Lane	3
Second premium, W. A. Ennis, Clermont	2
Wild geese, W. A. Ennis, Clermont	3
Second premium, Stanton & Gregg, Greenwood	2
Pekin ducks, Tilson & Robinson, Rock Lane	3
Second premium, James Stuart, Indianapolis	2
Rouen ducks, H. C. G. Bals, Indianapolis	3
Second premium, H. C. G. Bals, Indianapolis	2
Aylesbury ducks, Tilson & Robinson, Rock Lane	3
Second premium, Tilson & Robinson, Rock Lane	2
Heaviest live turkey, John Marvel, Royalton, Boone county	5
Heaviest cock, or cockerel, Tilson & Robinson, Rock Lane	3
Heaviest hen or pullett, Sid. Conger, Flat Rock	2
Brood chicks under 1 week old, pure breed, G. A. Danley, Indianapolis	3

NON-ENUMERATED POULTRY.

Mottled Javas, fowls, second premium, Burnett Stapp, Hope	2
Mottled Javas, chicks, second premium, Burnett Stapp, Hope	2

Black Javas, chicks, Burnett Stapp, Hope	$3
Muscovy ducks, R. S. Russell, Zionsville	3
Muscovy ducks, second premium, Will Seiders, Indianapolis	2
Japanese Bantams, H. VanHummell, Indianapolis	3
Rumpless chicks, W. J. Elstun, Indianapolis	2
Silver duck-wing Bantams, fowls, R. H. O'Brist, Indianapolis	2
Silver duck-wing Bantams, chicks, R. H. O'Brist, Indianapolis	2
Second premium, R. H. O'Brist, Indianapolis	1
Red Pile game chicks, Sid. Conger, Flat Rock	2

Committee—B. M. Pierce, of Iowa.

AGRICULTURAL DEPARTMENT.

J. K. O'NEAL, Superintendent.

(None but actual producers could compete in classes 26, 27, 28, 29.)

CLASS XXVI.—Vegetables.

Three cauliflowers, J. H. Thomas, Lawrence, Marion county	$2
Second premium, John Marvel, Royalton	1
Six broccoli, John Marvel, Royalton	2
Second premium, J. H. Thomas, Lawrence	1
Six vegetable eggs, H. T. Adams, Logansport	2
Second premium, Henry Adams, Logansport	1
Six cucumbers, H. T. Adams, Logansport	2
Second premium, J. H. Thomas, Lawrence	1
Peck white beans, H. T. Adams, Logansport	2
Second preminm, G. Blubaugh, Warsaw, Kosciusko county	1
Two quarts lima beans, John Marvel, Royalton	1
Second premium, J. H. Thomas, Lawrence	50c.
Half gallon garden peas, dry, J. H. Thomas, Lawrence	2
Second premium, H. T. Adams, Logansport	1
Half gallon field peas, dry, H. T. Adams, Logansport	2
Second premium, J. H. Thomas, Lawrence	1
Half peck peppers, for pickling, J. H. Thomas, Lawrence	2
Second premium, J. Mummaw, Warsaw	1
Peck Tomatoes, Thomas Thatcher, Indianapolis	2
Second premium, J. H. Thomas, Lawrence	1
Collection of Tomatoes, J. H. Thomas Lawrence	2
Second premium, H. T. Adams, Logansport	1
Half dozen ears sweet corn, (green), J. H. Thomas, Lawrence	2
Second premium, H. T Adams, Logansport	1

Half dozen ears sweet corn, (dry), W. A. Ennis, Clermont	$2
Second premium, J. H. Thomas, Lawrence	1
Three squashes, any kind, Peter Hartsock, Lawrence	2
Second premium, H. T. Adams, Logansport	1
Three pumpkins, H. T. Adams, Logansport	2
Second premium, J. L. Sailors, Wabash	1
Three drum-head cabbage, H. T. Adams, Logansport	2
Second premium, John Marvel, Royalton	1
Three flat Dutch cabbage, H. T. Adams, Logansport	2
Second premium, John Marvel, Royalton	1
Three cabbages, any kind, H. T. Adams, Logansport	2
Second premium, S. W. Oldfather, Warsaw	1
Dozen stalks celery, H. T. Adams, Logansport	2
Second premium, J. H. Thomas, Lawrence	1
Collection vegetables by any one amateur exhibitor, H. T. Adams, Logansport	10
Second premium, J. H. Thomas, Lawrence	5
Collection vegetables by one professional exhibitor, Anthony C. Hays, Elizabethtown, Ohio	10

Committee—R. S. Wells, Shelbyville; L. S. Fitch, Oakwood; J. C. Custer, Logansport.

CLASS XXVII.—Root Crops.

Half bushel turnips, H. T. Adams, Logansport	$2
Second premium, J. H. Thomas, Lawrence	1
Dozen parsnips, J. A. Merryman, Lawrence	2
Second premium, J. H. Thomas, Lawrence	1
Dozen radishes, H. T. Adams, Logansport	2
Second premium, A. C. Hays, Elizabethtown, Ohio	1
Dozen carrots, J. H. Thomas, Lawrence	2
Second premium, John Marvel, Royalton	1
Dozen roots salsify, J. H. Thomas, Lawrence	2
Second premium, H. T. Adams, Logansport	1
Dozen horseradish, A. C. Hays, Elizabethtown, Ohio	2
Second premium, J. H. Thomas, Lawrence	1
Half dozen red beets, Mrs. S. Johnson, Irvington	2
Second premium, John Marvel, Royalton	1
Half dozen turnip beets, J. L. Sailors, Wabash	2
Second premium, J. Mummaw, Warsaw	1
Half dozen sugar beets, J. Mummaw, Warsaw	2
Second premium, J. H. Thomas, Lawrence	1
Half peck red onions, H. T. Adams, Logansport	2
Second premium, J. H. Thomas, Lawrence	1

Half peck yellow onions, J. L. Sailors, Wabash	$2
Second premium, J. H. Thomas, Lawrence	1
Half peck white onions, J. H. Thomas, Lawrence	2
Second premium, John Marvel, Royalton	1
Dozen turnip radishes, Henry Adams, Logansport	1
Second premium, John Marvel, Royalton	50c.
Dozen long radishes, Henry Adams, Logansport	1
Second premium, J. H. Thomas, Lawrence	50c.
Display of onions in variety and quality	3
Second premium, J. L. Sailors, Wabash	1

Committee—R. S. Wells, Shelbyville; L. S. Fitch, Oakwood, Laporte county; J. C. Custer, Logansport.

CLASS XXVIII.—Potatoes.

Peck pink peach blows, John Marvel, Royalton	$2
Peck white peach blows, John Marvel, Royalton	2
Second premium, W. A. Ennis, Clermont	1
Peck early rose, H. T. Adams, Logansport	2
Second premium, A. C. Hays, Elizabethtown, Ohio	1
Peck snowflake, J. L. Sailors, Wabash	2
Second premium, Henry A. Smith, Danville	1
Peck Pink-Eyes, W. A. Ennis, Clermont	2
Second premium, Otho Hays, Elizabethtown, Ohio	1
Peck Shaker russets, H. T. Adams, Logansport	2
Second premium, A. C. Hays, Elizabethtown	1
Peck Peerless potatoes, H. T. Adams, Logansport	2
Second premium, J. L. Sailors, Wabash	1
Half bushel sweet potatoes, J. J. Johnson, Castleton	2
Second premium, J. J. Johnson, Castleton	1
Peck early potatoes, any kind, Otho Hays, Elizabethtown, Ohio	2
Second premium, T. M. Robinson, Rock Lane, Johnson county	1
Peck late potatoes, any kind, S. A. Snoddy, Dayton	2
Second premium, H. T. Adams, Logansport	1
Peck Beauty of Hebron, H. T. Adams, Logansport	2
Second premium, J. H. Thomas, Lawrence	1
Peck Victor, S. A. Snoddy, Dayton	2
Second premium, J. L. Sailors, Wabash	1
Peck Burbank seedling, J. L. Sailors, Wabash	2
Second premium, A. C. Hays, Elizabethtown, Ohio	1
Collection Irish potatoes, not less than ten kinds, H. T. Adams, Logansport	5
Second premium, W. A. Ennis, Clermont	2

Committee—R. S. Wells, Shelbyville; L. S. Fitch, Oakwood; J. C. Custer, Logansport.

CLASS XXIX.—Grain and Seeds.

(Grain in this class must have been grown within the year exhibited.)

Half bushel early field dent corn in ear, John A. Heavenridge, Liberty	$5
Second premium, W. A. Ennis, Clermont	2
Half bushel yellow corn, in ear, J. M. Dye, Northfield	5
Second premium, S. A. Snoddy, Dayton	2
Half bushel white corn, in ear, J. A. Heavenridge, Liberty	5
Second premium, H. T. Adams, Logansport	2
Half bushel corn, any color, H. T. Adams, Logansport	5
Second premium, J. A. Heavenridge, Liberty	2
Half bushel hominy corn, J. A. Heavenridge, Liberty	2
Display and greatest variety corn, all kinds, not less than one-half gallon each variety, H. T. Adams, Logansport	10
Display and variety of wheat, all kinds, not less than one-half gallon each variety, W. A. Ennis, Clermont	10
Half bushel white wheat, W. A. Ennis, Clermont	5
Second premium, John Marvel, Royalton	2
Half bushel red wheat, I. P. Smith, Warsaw	5
Second premium, W. A. Ennis, Clermont	2
Half bushel spring wheat, S. A. Snoddy, Dayton	5
Second premium, A. C. Hays, Elizabethtown, Ohio	2
Half bushel rye, S. A. Snoddy, Dayton	2
Half bushel oats, S. A. Snoddy, Dayton	2
Half bushel buckwheat, Henry Kelly, Warsaw	2
Half bushel barley, W. A. Ennis, Clermont	2
Half bushel flaxseed, S. W. Oldfather, Warsaw	2
Half bushel timothy seed, T. W. W. Sunman, Spades	2
Half bushel orchard grass seed, W. A. Ennis, Clermont	2
Half bushel Kentucky blue grass seed, W. A. Ennis, Clermont	2
Half bushel English blue grass seed, W. A. Ennis, Clermont	2
Half bushel red top grass seed, S. W. Oldfather, Warsaw	2
Half bushel red clover seed, J. H. Thomas, Lawrence	2
Half bushel English clover seed, S. W. Oldfather, Warsaw	2
Sample 10 lbs. brown corn, John Marvel, Royalton	2

Committee—R. S. Wells, Shelbyville; L. S. Fitch, Oakwood; J. C. Custer, Logansport.

CLASS XXX.—Butter, Cheese and Honey.

Thirty pounds creamery butter, Excelsior Creamery Co., Indianapolis	Diploma and $8
Five pounds dairy butter, Mrs. George Jackson, Indianapolis	5
Second premium, W. H. Hartman, Southport	3

Thirty pounds factory cheese, Excelsior Creamery Co., Indianapolis	Diploma and $8
Ten pounds comb honey in packages of one pound or more, W. A. Horton, Macy, Miami county	5
Second premium, Daugherty & McKee, Indianapolis	2
Ten pounds or more one-pound packages extracted honey, Daugherty & McKee, Indianapolis	5
Crate of honey in the comb, in most marketable shape, Daugherty & McKee, Indianapolis	6
Display of honey, back comb and extracted, Daugherty & McKee, Indianapolis	5
Display of wax, Daugherty & McKee, Indianapolis	2
Machine for extracting honey, Daugherty & McKee, Indianapolis	Diploma
Display of bee-keeping supplies, Daugherty & McKee, Indianapolis	Diploma

Committee.—R. S. Wells, Shelbyville; L. S. Fitch, Oakwood; J. C. Custer, Logansport.

CLASS XXXI.—Cigars and Smokers' Articles.

(NON-ENUMERATED.)

Schnull & Co., Indianapolis	Diploma
P. Lorillard & Co., Jersey City, N. J	Diploma
John Rauch, Indianapolis	Diploma
Canned goods, Schnull & Co., Indianapolis	Diploma
Grocers' furniture, tea-drawing apparatus, etc., Schnull & Co., Indianapolis	Diploma

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HORTICULTURAL DEPARTMENT.

JOSEPH GILBERT, Superintendent.

CLASS XXXII.—Amateur List.

APPLES.

Twenty varieties of apples, A. B. Shelledy, Danville	$15
Twelve varities of apples, W. B. Flick, Lawrence	10
Six varieties of apples, F. E. Baker, Champaign, Illinois	5

PEACHES.

Three varities of peaches, Solomon Hays, Elizabethtown, Ohio	$3
One variety of peaches, Solomon Hays, Elizabethtown, Ohio	2

GRAPES—Grown in Open Air.

Five varieties of grapes, F. E. Baker, Champaign, Illinois	$5
Three varieties of grapes, Cornelius O'Haver, Danville	3
Five clusters grapes, any kind, C. O'Haver, Danville	2

DISPLAY OF FRUITS—All Kinds.

F. E. Baker, Champaign, Illinois	$25

The collections of fruits from DeKalb and Kosciusko counties were very fine displays, and added much to the interest of the fruit show in Horticultural Hall.

Committee—J. W. Furnas, Valley Mills; E. Y. Teas, Dunreith, Wayne county.

CLASS XXXIII.—Professional List.

APPLES.

Twenty varieties of apples, E. A. Eickhoff, Indianapolis	Diploma and $15
Twelve varieties of apples, H. M. Dunlap, Savoy, Illinois	Diploma and 10
Six varieties of apples, E. A. Eickhoff, Indianapolis	Diploma and 5

PEARS.

Ten varieties pears, E. A. Eickhoff, Indianapolis	Diploma and $10
Four varieties autumn pears, J. S. Boats, Spencerville, DeKalb county	Diploma and 5

GRAPES.

One variety of grapes, 10 clusters, E. A. Eickhoff, Indianapolis	Diploma and $2

DISPLAY OF FRUITS.

Display of fruits of all kinds, E. A. Eickhoff, Indianapolis	Diploma and $25
Collection nursery stock, arranged for exhibition adjoining Floral Hall, E. A. Eickhoff, Indianapolis	Diploma and 15

Committee—J. W. Furnas, Valley Mills; E. Y. Teas, Dunreith.

FLOWERS AND PLANTS—Professional List.

General collection of plants, Indianapolis Floral Society	$20
Collection of foliage plants Indianapolis Floral Society	6
Collection of lycopods and ferns, Indianapolis Floral Society	6
Display and variety of climbers, Indianapolis Floral Society	5
Collection of begonias, Indianapolis Floral Society	6
Collection of cacti, aloes, agaves, Indianapolis Floral Society	8

Collection of geraniums, Indianapolis Floral Society	$6
Three rustic stands, filled, Indianapolis Floral Society	6
Three hanging baskets, filled, Indianapolis Floral Society	3
Collection of palms, Indianapolis Floral Society	10
Collection of alocasias and calladiums, Indianapolis Floral Society	10
Collection of cannas, Indianapolis Floral Society	5
Arranged Wardian case, Indianapolis Floral Society	4
Collection loose cut flowers, Indianapolis Floral Society	10
Display and arrangement cut roses, Indianapolis Floral Society	5
Ten funeral designs, Indianapolis Floral Society	20
Collection basket designs, not less than 10 pieces, Indianapolis Floral Society.	20
Collection bouquets, not less than ten, Indianapolis Floral Society	10

Committee—Harry Thudium, Indianapolis; Henry Mankedink, Indianapolis.

FLOWERS AND PLANTS—Amateur List.

Collection of plants, H. O. Thudium, Indianapolis	$10
Second premium, Miss M C. Stewart, Indianapolis	5
Collection of Begonias, not less than 10 varieties, H. O. Thudium, Indianapolis	5
Second premium, Miss M. C. Stewart, Indianapolis	3
Agave, H. O. Thudium, Indianapolis	2
Rustic stand, filled, Miss M. C. Stewart, Indianapolis	2
Second premium, H. O. Thudium, Indianapolis	1
Night-blooming Cereus, H. O. Thudium, Indianapolis	2
Alocasia, H. O. Thudium, Indianapolis.	2
Canna, Miss M. C. Stewart, Indianapolis	2
Second premium, H. O. Thudium, Indianapolis	1
Hanging basket, filled, H. O. Thudium, Indianapolis	2
Second premium, Miss M. C. Stewart, Indianapolis	1
Collection cut flowers, Mrs. Dudley Rogers, Greencastle	8
Second premium, Mrs. F. A. Townsend, Indianapolis	4
Collection cut geraniums, Mrs. Dudley Rogers, Greencastle.	4
Second premium, Miss M. C. Stewart, Indianapolis	2
Collection cut roses, Mrs. Dudley Rogers, Greencastle	8
Second premium, Mrs. A. M. Robertson, Indianapolis	4
Collection cut verbenas, Miss M. C. Stewart, Indianapolis	4
Second premium, Mrs. Dudley Rogers, Greencastle	2
Hanging basket, filled, H. O. Thudium, Indianapolis	3
Pot-grown fern, H. O. Thudium, Indianapolis	3
Second premium, Miss M. C. Stewart, Indianapolis	2
Third premium, Mrs. S. Johnson, Irvington	1
Six pot-grown geraniums, in bloom, Miss. M. C. Stewart, Indianapolis	3
Second premium, H. O. Thudium, Indianapolis	2

Committee—Mrs. Solomon Claypool, Indianapolis; Miss Mary D. Naylor, Crawfordsville; Mrs. Geo. Hayward, Terre Haute.

GEOLOGY, NATURAL HISTORY, ETC.

PROF. JOHN COLLETT, Superintendent.

CLASS XXXIV.

General collection of fossils, Michael Zeller, Crawfordsville	$5
Second premium, Michael Zeller, Crawfordsville	2
Dr. James Knapp, Louisville, Ky.	Diploma
General collection of minerals, Natural Science association, Indianapalis,	Diploma
General collection of shells, M. Z. Black, Indianapolis	Diploma
Collection of fresh water shells, Natural Science association, Indianapolis,	Diploma
Collection of mounted birds and animals, Edward Bonge, Cumberland, Marion county	$20
Second premium, Mrs. Jessie M. Brayton, Indianapolis	10
Collection diurnal lepidoptera, Natural Science Association, Indianapolis	3
W. J. Chambers, Kent, Jefferson county	Diploma
Collection nocturnal lepidoptera, Mary Fairfield, Indianapolis	$3
Collection of insects, W. J. Chambers, Kent	3

COLLECTION OF BOTANICAL SPECIMENS.

Miss Libbie Murry, herbarium, Indianapolis	Diploma
Miss Electa Murry, herbarium, Indianapolis	Diploma
Miss Allie Gage, herbarium, Indianapolis	Diploma
Miss Emma Caldwell, herbarium, Indianapolis	Diploma
Miss Jessie Aldrich, herbarium, Indianapolis	Diploma
Collection coins and medals, Leo Woerner, Indianapolis	Diploma
Educational exhibit in natural history, Rev. G. L. Curtiss, Indianapolis	Diploma

"These herbariums deserve special mention, as being five, of one hundred, prepared in the High School of Indianapolis, and averaged from forty to one hundred and fifty specimens. Miss Jessie Aldrich exhibited one hundred and fifty specimens, well mounted and arranged according to Gray's botany."

Especial merit is awarded to the collection of Mr. Zeller. It is well known to paleontologists that at Crawfordsville is one of the finest beds of crinoids in the world. Mr. Zeller's collection illustrates them fully, and, in the marked absence of any college exhibit, this fine array filled an important gap in the Natural History exhibit, and was highly commended by Prof. Collett.

The collection of mounted birds and animals consisted of two exhibits. That of Edward Bonge, of Cumberland, was very superior as regards mounting. Mrs. Jessie Brayton exhibited two hundred specimens of Indiana birds, a student's series, of hand specimens, well arranged and classified.

Committee—Alembert W. Brayton and J. N. Hurty, Indianapolis.

CLASS XXXV.

Block coal, Cobb & Branham, Indianapolis	Diploma
Caking coal, Cobb & Branham, Indianapolis	Diploma
Cannel coal, Cobb & Branham, Indianapolis	Diploma
Coke, Cobb & Branham, Indianapolis	Diploma
Building stone, Howard & Denig, Indianapolis	Diploma
Manufactured fertilizer, E. Rauh & Son, Indianapolis	Diploma
Collection and variety of coal from any one county in Indiana, Cobb & Branham, Indianapolis	Diploma and $5

Committee—J. N. Hurty, Indianapolis; A. W. Brayton, Indianapolis.

WOMAN'S DEPARTMENT.

MRS. MARY E. HAGGART, Superintendent.

CLASS XXXVII.—Domestic Manufactures.

All wool coverlet, Mrs. E. B. Kirk, Shelbyville	$2
Cotton coverlet, Mrs. Jacob Parrish, Indianapolis	2
Pair blankets, Mrs. J. Leibhardt, Knightstown	3
Counterpane, knit, Mrs. S. M. Hamilton, Indianapolis	2
Counterpane, crochet, Mrs. Sophia Belch, Indianapolis	2
Ten yards plaid flannel, Mrs. Jacob Parrish, Indianapolis	2
Ten yards rag carpet, Mrs. Dr. Homer, Knightstown	2
Worsted quilt, Mrs. T. J. Gist, Terre Haute	2
Second premium, Miss Jennie Swift, Connersville	1
Silk quilt, Mrs. S. Lee, Indianapolis, (Age 91.)	3
Second premium, Mrs. T. E. Reynolds, Noblesville	2
Calico quilt, Mrs. Amanda Warner, Brazil	2
Second premium, Mrs. W. H. Walker, Indianapolis	1
Floor mat, Worsted, Mrs. M. F. Shera, Indianapolis	2
Rug, Ida Smith, Indianapolis	2
Second premium, Mrs. M. A. Taylor, Indianapolis	1

Tufted door mat, Mrs. M. F. Shera, Indianapolis	$1
Canvas door mat, Serepta Ferris, Indianapolis	1

Committee—Mrs. S. J. Shoptaugh, Princeton; Mrs. L. Holloway, Spiceland.

CLASS XXXVIII.

Infant's knit or crochet shirt, Mrs. J. E. Howe, Muncie	$1
Infant's knit or crochet socks, Mrs. J. E. Howe, Muncie	1
Pair knit or crochet mittens, Mrs. L. Ousler, Noblesville	1
Pair woolen stockings or socks, hand-knit, Mrs. Amanda Warner, Brazil	1
Pair cotton stockings or socks, hand-knit, Mrs. M. F. Shera, Indianapolis	1
Pair linen stockings, hand-knit, Mrs. McChesney, Indianapolis	1
Knit or crochet shawl, Clotilde Keslar, Indianapolis	2
Knit or crochet slippers, Mrs. A. B. Bosserman, Indianapolis	1
Knit or crochet hood, Mrs. M. Posz, Shelbyville	1
Knit or crochet fascinator, Mrs. Siddall, Indianapolis	1
Crochet sacque, Mrs. S. G. Leonard, Indianapolis	1
Crochet cloak, Mrs. D. W. Coffin, Indianapolis	1
Knit or crochet gentleman's scarf, Mrs. Dr. R. H. Homer, Knightstown	1
Crochet cotton tidy, Mrs. Nancy Houk, Indianapolis	1
Crochet worsted tidy, Mrs. Laura Burns, Greensburg	1
Afghan, Mrs. E. W. Mathews, Indianapolis	3
Second premium, Mamie Schofield, Indianapolis	2
Afghan, infant's, Mrs. A. M. Robertson, Indianapolis	2
Second premium, Mrs. Dr. R. H. Homer, Knightstown	1
Fancy knitting specimen, Miss Mary C. Howe, Princeton	1

NON-ENUMERATED.

Crochet buttons, Mrs. M. F. Owens, Indianapolis	2
Crochet and knit child's skirt, Mrs. G. L. Snyder, North Indianapolis	White Ribbon.

Committee—Mrs. S. J. Shoptaugh, Princeton; Mrs. L. Holloway, Spiceland.

CLASS XXXIX.—Lace Work.

Point lace, display, Mrs. Laura Burns, Greensburg	$5
Point lace, specimen, Miss Julia Minich, Indianapolis	3
Second premium, Miss Fannie Galey, Crawfordsville	2
Guipure lace, specimen, Mrs. M. Mooney, Columbus	3
Second premium, Miss Laura Burns, Greensburg	2
Pillow lace, specimen, Miss Alice McQuiddy, Indianapolis	2

Darning on net, specimen, Mrs. Ann Howell, (age 74), Indianapolis	$2
Second premium, Mrs. Chas. Railsback, Indianapolis	1
Applique lace, specimen, Mrs. C. W. Wright, Crawfordsville	2
Second premium, Mrs. J. Deathe, Richmond	1
Crochet lace, display, Mrs. L. Recker, Indianapolis	2
Knit lace, display, Malinda Murphy, Indianapolis	2
Tatting, display, Miss. E. J. Marsee, Indianapolis	2
Netted guipure lace, display, Miss Mary Howe, Princeton	3
Breton lace, display, Mrs. S. H. Woodbridge, Indianapolis	2
Macrame lace, display, Miss Sallie Mitchell, Terre Haute	2
Curtain lace, home made, Mrs. M. E. Crist, Crawfordsville	2

Committee—Mary D. Naylor, Crawfordsville; Mrs. J. R. Wood, Covington.

CLASS XL.—Embroidery and Braiding.

Embroidery with linen floss, specimen, Mrs. J. Liebhardt, Knightstown	$2
Second premium, Mrs. M. Posz, Shelbyville	1
Embroidery, yoke and sleeves, Mrs. S. Lee, Indianapolis	2
Second premium, Mrs. J. Liebhardt, Knightstown	1
Embroidery, night dress, Mrs. Robert Cathcart, Indianapolis	2
Embroidery, child's dress, Miss Laura Burns, Greensburg	2
Second premium, Miss Libbie Montgomery, Indianapolis	1
Embroidery, table set, Mrs. C. Muchmore, Shelbyville	2
Embroidery, bed set, Mrs. C. Muchmore, Shelbyville	2
Embroidery, handkerchief, Mrs. J. Liebhardt, Knightstown	1
Embroidery, silk, specimens, Mrs. Dr. Bobbs, Indianapolis	2
Embroidery, silk stockings, Miss Laura Burns, Greensburg	1
Embroidery, silk sacque, Mrs. Robert Cathcart, Indianapolis	2
Embroidery, silk skirt, Mrs. J. Liebhardt, Knightstown	2
Embroidery, infant's shawl, silk, Mrs. Robert Cathcart, Indianapolis	2
Second premium, Miss Jennie Swift, Connersville	1
Embroidery, skirt, worsted, Miss Laura Burns, Greensburg	2
Embroidery, table cover, Mrs. J. E. Howe, Muncie	3
Second premium, Mrs. Samuel Taylor, Indianapolis	2
Embroidery, ottoman cover, Mrs. A. M. Robertson, Indianapolis	2
Second premium, Miss Jennie Swift, Connersville	1
Embroidery, chair cover, Mrs. J. E. Howe, Muncie	2
Embroidery, chair cushion, Mrs. M. Posz, Shelbyville	2
Embroidery, sofa cushion, Edith Heitkam, Indianapolis	2
Second premium, Mrs. Clotilde Keslar, Indianapolis	1
Embroidery, toilet cushion, Mrs. J. E. Howe, Muncie	2
Second premium, Mrs. J. Deathe, Richmond	1
Embroidery, pin cushion, Allie Johnson, Waterloo, DeKalb county	1
Embroidery, infant's cloak, Mrs. T. L. Foulds, Indianapolis	2

Embroidery, scarf, Mrs. E. B. Kirk, Shelbyville	$1
Embroidery, bead, specimen, Mrs. A. Mueller, Indianapolis	2
Second premium, Mrs. J. Liebhardt, Knightstown	1
Embroidery, applique, specimen, Mrs. J. E. Howe, Muncie	2
Second premium, Mrs. A. M. Robertson, Indianapolis	1
Embroidery, outline, or etching, display, Mrs. A. M. Robertson, Indianapolis,	2
Embroidery, outline, or etching, specimen, Mrs. M. Posz, Shelbyville	1
Embroidery, Kensington, specimen, Jessie Hughes, Indianapolis	3
Second premium, Mrs. L. K. Price, Marion, Grant county	2
Embroidery, tapestry, display, Mrs. A. M. Robertson, Indianapolis	3
Embroidery, tapestry, specimen, Mrs. M. Posz, Shelbyville	2
Embroidery, art in colors, specimen, Mrs. A. M. Robertson, Indianapolis	3
Second premium, Mrs. L. K. Price, Marion	2
Embroidery, chenille, specimen, T. V. Greenstreet, Indianapolis	3
Second premium, Mrs. J. C. Straughan, Indianapolis	2
Braiding, display, Mrs. Jennie Swift, Connersville	2
Braiding, specimen, Mrs. J. Leibhardt, Knightstown	1

Committee—H. V. Austin, Richmond.

CLASS XLI.—Sewing—Machine and Hand.

Machine work, five articles, Mrs. S. M. Schwartz, Indianapolis	$3
Machine work, shirt, Mrs. M. Posz, Shelbyville	1
Machine work, calico dress, Miss Laura Burns, Greensburg	1
Hand sewing, garment, Harriet King, Brazil	1
Hand sewing, shirt, Miss Laura Burns, Greensburg	1
Dress, worsted or silk, Mrs. S. K. Rothwell, Indianapolis . . . Diploma and	5
Second premium, Mrs. S. K. Rothwell, Indianapolis	3
Boy's suit, Mrs. E. B. Kirk, Shelbyville	2
Darning on old garment, Mrs. Albert Yohn, Indianapolis	1
Patching on old garment, Mrs. Dr. R. H. Homer, Knightstown	1
Buttonholes, display on different materials, T. E. Reynolds, Noblesville	2
Second premium, Mrs. T. J. Gist, Terre Haute	1
Hem-stitching, specimen, Mrs. N. Kingman, Indianapolis	1

Committee—Mrs. J. W. Shideler, Marion; Mrs. H. V. Austin, Richmond.

CLASS XLII.—Miscellaneous.

Wax flowers, Mrs. John Newman, Indianapolis	$3
Wax fruit, Miss Edith Heitkam, Indianapolis	3
Wax work, ornamental, Mrs. D. O. Crist, Indianapolis	3
Decalcomania or transfer work, display, Mrs. E. B. Kirk, Shelbyville	1
Shell work, display, Lydia Copeland, Indianapolis	2
Bead work, display, Mrs. E. B. Kirk, Shelbyville	2

Card receiver, Mrs. —— Hawkins, Indianapolis	$1
Handkerchief box, Mrs. Chas. Railsback, Indianapolis	1
Glove box, Mrs. T. F. Smithers, Indianapolis	1
Spatterwork, on card board, specimen, Mrs. Ella O. Johnson, Indianapolis	1
Spatterwork, on cloth, specimen, Mrs. Dr. R. H. Homer, Knightstown	1
Sea moss, ornament, Miss Yohn, Indianapolis	2
Wood moss, ornament, Miss Hattie Scott, Indianapolis	1
Autumn leaves, ornamental display, M. E. Crist, Crawfordsville	1
Feather work, on cloth, Mrs. D. W. Coffin, Indianapolis	1
Toilet cushion, not embroidered, Mrs. M. Posz, Shelbyville	2
Second premium, Jesse Hughs, Indianapolis	1
Sofa pillow, not embroidered, Mrs. E. F. Moore, Indianapolis	2
Second premium, F. V. Greenstreet, Indianapolis	1
Lamp mats, fancy, Mrs. J. E. Howe, Muncie	1
Toilet mats, Mrs. M. M. Hayman, Indianapolis	2
Picture tapestry work, Mrs. John Tarlton, Indianapolis	3
Second premium, Mrs. John Tarlton, Indianapolis	2
Chair stripes, Jesse Hughs, Indianapolis	2
Lambrequins, Mrs. J. E. Howe, Muncie	2
Tidy, not crochet, Mrs. M. E. Crist, Crawfordsville	2
Second premium, Mrs. J. E. Howe, Muncie	1
Painting on silk or satin, display, Miss Sue Ketcham, Indianapolis	5
Second premium, Mrs. Clotilde Thomas, Indianapolis	3
Painting on tiles, Miss Sue Ketcham, Indianapolis	3
Painting on panels, display, Mrs. D. W. Coffin, Indianapolis	3
Painting on wood, display, Mrs. D. W. Coffin, Indianapolis	2
Painted toilet set, display, Miss Libbie Murry, Indianapolis	1
Painted work, miscellaneous, Mrs. Clotilde Thomas, Indianapolis	Diploma.
Decorated china, display, Miss Sue Ketcham, Indianapolis	5
Second premium, Miss Ada Comingore, Indianapolis	3
Decorated china, specimen, Miss Ada Comingore, Indianapolis	2
Painted fan, Mrs. D. W. Coffin, Indianapolis	1
Fret sawing, display, Mattie Tarbell, Indianapolis	2
Inlaid work, display, Mattie Tarbell, Indianapolis	3
Design for a dwelling house by a woman, Mrs. E. C. Buskirk, Indianapolis	2
Job printing, display, by a woman, Mrs. H. M. Diamond, Indianapolis	2

Committee—Miss Carrie Vawter, Franklin; Mrs. H. H. Crist, Crawfordsville.

CLASS XLIII.—Dry Goods, Millinery, Etc.

Hair goods and work, display, Mrs. A. S. Fowler, Indianapolis	Diploma
Millinery, display, W. Woodbridge, Indianapolis	Diploma
Two bonnets, W. Woodbridge, Indianapolis	Diploma

Committee—Mary D. Naylor, Crawfordsville; Mrs. Geo. Hayward, Terre Haute.

CLASS XLIV.—Culinary Articles.

(All articles in this class must be strictly home-made, and will be fully tested by taste and sight).

Honey, in comb, five pounds, exhibited by a woman, Miss Lizzie McLane, Shelbyville	$3
Bread, loaf, wheat, yeast, Mrs. E. Owen, Indianapolis	2
Second premium, Mrs. W. J. Roach, Indianapolis	1
Bread, wheat, salt-rising, Mrs. G. A. Danley, Indianapolis	2
Second premium, Mrs. J. A. Comingore, Indianapolis	1
Graham bread, yeast, Mrs. M. E. Baker, Indianapolis	2
Second premium, Mrs. G. A. Danley, Indianapolis	1
Graham bread, salt-rising, Mrs. G. A. Danley, Indianapolis	2
Second premium, Mrs. Lottie Spicer, Columbus	1
Bread, corn, Mrs. G. A. Danley, Indianapolis	2
Second premium, Mrs. M. J. Thomas, Lawrence	1
Rusks, Mrs. G. A. Danley, Indianapolis	2
Crullers, Mrs. Lottie Spicer, Shelbyville	1
Pound cake, Mrs. J. A. Comingore, Indianapolis	3
Fruit cake, Mrs. Lottie Spicer, Shelbyville	3
Jellies, collection, Mrs. Annie Stilz, Indianapolis	3
Preserves, collection, not less than one pint each, M. Gearhart, Indianapolis	3
Second premium, M. E. Crist, Crawfordsville	2
Fruit butter, not less than one pint each, M. E. Crist, Crawfordsville	3
Pickles, collection, M. E. Crist, Crawfordsville	2
Second premium, Mrs. Annie Stilz, Indianapolis	1
Canned fruit, not less than one pint each, Mrs. J. C. Adams, Indianapolis	5
Second premium, M. E. Crist, Crawfordsville	3
Maple molasses, half gallon, Mrs. A. W. Parrish, Indianapolis	1
Tomato catsup, not less than one pint, Mrs. J. F. Coburn, Indianapolis	1

Committee—Mrs. E. N. Bacon, Indianapolis; Mrs. George Hayward, Terre Haute.

CHILDREN'S DEPARTMENT.

(This Department was open to boys and girls, under sixteen years of age at the time of the fair. Culinary articles were subject to rules governing last class).

CLASS XLV.

Loaf wheat bread, yeast, Minnie Boyd, Indianapolis	$2
Second premium, Nellie Brown, North Indianapolis	1
Loaf wheat bread, salt-rising, Maggie Long, Indianapolis	2
Second premium, Nellie Brown, North Indianapolis	1

Cake, Gertrude Darling, North Indianapolis	$3
Second premium, Maria Fletcher, Indianapolis	2
Pickles, collection, Miss Annie B. Marvel, Royalton	1
Hand sewing, chemise, Gertrude Darling, North Indianapolis	1
Hand sewing, garment, Gertrude Darling, North Indianapolis	1
Patching on old garment, display, Nellie Brown, North Indianapolis	2
Second premium, Miss Lillie Homer, Knightstown	1
Darning on old garment, Lillie Homer, Knightstown	2
Second premium, Nellie Brown, North Indianapolis	1
Buttonholes. display on different materials, Lillie Homer, Knightstown	2
Embroidery, yoke and sleeves, Yuba M. Burns, Greensburg	2
Embroidery, darning on net, Miss Georgie Henchman, Indianapolis	1
Embroidery, worsted, specimen, Ida Muchmore, Shelbyville	2
Second premium, Yuba M. Burns, Greensburg	1
Embroidery, silk, specimen, Georgie Huston, Indianapolis	2
Second premium, Yuba M. Burns, Greensburg	1
Crochet work, display, Miss Lillie Cook, Indianapolis	2
Second premium, Carrie Rouse, Indianapolis	1
Tidy, Miss Lillie Homer, Knightstown	2
Second premium, Minnie Alice Coffin, Indianapolis	1
Pin cushion, Ida Muchmore, Shelbyville	1
Toilet set, Carrie Rouse, Indianapolis	2
Picture in needlework, Bertha Laube, Indianapolis	2
Perforated card board work, display, Lillie Homer, Knightstown	2
Picked work, display, Miss Maggie Hollette, Indianapolis	1
Wax work, display, Miss Edith Heitkam, Indianapolis	1
Paper flowers, display, Minnie Willard, Indianapolis	2
Second premium, Minnie Boyd, North Indianapolis	1
Painting on wood, display, Valette Miller, Indianapolis	2
Painting on tiles, display, Pearlie Johnson, Indianapolis	2
Fret sawing, display, Joe Harper, Indianapolis	2
Second premium, Charlie Greenstreet, Indianapolis	1
Autumn leaves, ornamental, display, Lillie Homer, Knightstown	1
Woods, collection, named, Fletcher M. Noe, Indianapolis	1
Minerals, collection, named, Fletcher M. Noe, Indianapolis	1
Butterflies, collection, Fletcher M. Noe, Indianapolis	2
Second premium, Fletcher M. Noe, Indianapolis	1
Insects, collection, Fletcher M. Noe, Indianapolis	2
Stamps, collection, Fletcher M. Noe, Indianapolis	1
Curiosities, collection, Fletcher M. Noe, Indianapolis	1
Old coins, collection, Fletcher M. Noe, Indianapolis	2
Second premium, Fletcher M. Noe, Indianapolis	1
Stuffed birds, collection, Fletcher M. Noe, Indianapolis	4
Second premium, Fletcher M. Noe, Indianapolis	2
Stuffed animals, collection, Fletcher M. Noe, Indianapolis	6

WOMAN'S DEPARTMENT.

NON-ENUMERATED LIST.

(*Premiums Awarded by Executive Committee Women's Association.*)

Crochet buttons, Mrs. M. F. Owens, Indianapolis	$2
Crochet and knit child's skirt, Mrs. G. L. Snyder, North Indianapolis	White ribbon
Embroidered towels, Lillie Jenkins, Indianapolis	Commendable
Cloth gloves, Mrs. Amanda Warner, Brazil	Commendable
Paper box, Miss Lena Keen, Indianapolis	$1
Hair flower cross, Mrs. Jane L. Williams, Indianapolis	White ribbon
Paper flowers, Mrs. Ella O. Johnson, Indianapolis	White ribbon
Feather flowers, Miss Rawlins, St. Louis, Mo	White ribbon
Water color portraits, Mrs. Julia Ludington, Indianapolis	$5
Flower piece in oil, Mrs. Julia Ludington, Indianapolis	3
Oil painting, Mrs. Clotilde Thomas, Indianapolis	Worthy of notice
Plaster of paris work, Mrs. D. O. Crist, Indianapolis, awarded special premium	$3
Oil painting, dog's head, Mrs. C. Ingraham, Indianapolis	Very fine, worthy of special attention
Oil portrait, Mrs. Enos B. Reed, Indianapolis	Very fine
Knitting machine, Miss Amelia Allisch, Indianapolis	Honorable mention
Corset and shoulder brace, display, Miss Emma Rawlings, St. Louis, Mo	Diploma

Committee—Mary D. Naylor, Crawfordsville; Mrs. Geo. Hayward, Terre Haute.

Collection canned fruit and vegetables, A. M. Palmer, Toronto, Ont.	Diploma
Architectural design, Harry Whitman, Indianapolis	Worthy of notice by the press $2

Committee—Mrs. E. M. Bacon, Indianapolis; Mrs. Geo. Hayward, Terre Haute.

SPECIAL PREMIUMS

Offered by business men and firms, awarded at the annual State Fair, commencing September 26, 1881, under the usual rules and regulations.

WOMAN'S DEPARTMENT—MISCELLANEOUS.

A. L. Wright & Co., carpet house, 47 and 49 South Meridian street; best bouquet cut flowers, Miss Jennie Ragan, Clayton	$5
Howe Sewing Machine Co., 97 and 99 North Pennsylvania street; samples of plain and fancy stitching done on Howe machine, Mrs. Lottie Spicer, Shelbyville; a Howe sewing machine with box top, drop leaf, etc., with full set of attachments, worth	55
John Dury, shoe palace, 3 East Washington street; embroidered slippers, Mrs. J. C. Straughan, Indianapolis, one pair shoes, worth	5
L. W. Moses, optician, 4 North Pennsylvania street; plain knitting by lady over sixty years of age, Mrs. Ann Lewis, Indianapolis one pair silver spectacles, worth	3
C. C. Koerner, Indianapolis, Business College, Bates Block; specimen of book-keeping, Carrie Tarlton, Indianapolis; life scholarship in college, worth.	40
Johnson & Bennett, stove dealers, 62 East Washington street; specimen upholstered work, Mrs. J. E. Howe, Muncie, toilet set worth	5
J. C. Shoemaker, Indianapolis Sentinel; display of portraits in oil, Mrs. C. B. Ingraham, Indianapolis.	10
Chas. Mayer & Co., Toys, Fancy Goods, etc., 29 to 31 West Washington street; display of landscape in oil, Mrs. J. F. Julian, Indianapolis.	5
Woman's State Fair Association; display of water color paintings, Miss Sue Ketcham, Indianapolis	5
H. Lieber & Co., Art Emporium, 82 East Washington street; crayon picture by amateur, Mrs. D. W. Coffin, Indianapolis, one picture, worth . .	5
Mrs. C. B. Ingraham, Artist, 265 North Tennessee street; decorated Plaque, Miss Ada Comingore, Indianapolis	1
Johnson & Erwin, display of flower paintings, Miss Sue Ketcham, Indianapolis	2
A. L. Wright & Co., Carpets, Wall Paper, etc., 47 and 49 South Meridian street; five pounds home-made butter, Misss Annie P. Marvel, Royalton	5
L. S. Ayres & Co., Dry Goods, Millinery, etc., 33 to 37 West Washington street; five pounds home-made butter, Mrs. G. A. Danely, Indianapolis	5
Prof. T. J. McAvoy, Teacher of Elocution, room 64 Fletcher & Sharpe's Block; five pounds home-made butter, Stella Rees, Indianapolis, six months' scholarship in elocutionary school	50

New York Store, Dry Goods, Millinery, etc., 25 to 31 East Washington street; collection of brown bread, home-made, Mrs. G. A. Danley, Indianapolis	$5
T. W. W. Sunman, Spades; collection of bread, rusk and cake, by girl under 20 years of age; Stella Rees, Indianapolis, silver goblet, worth	10
Cadwallader, photographer, 2 West Washington street: apple pie, by girl under 22 years of age; Lillie Thompson, Indianapolis, dozen cabinet photographs of person, worth	6
Cadwallader, photographer, 2 West Washington street; chicken pie; Miss Emma Hayden, Indianapolis, one dozen living statuary photographs of person, worth	10
Craft & Co., jewel palace, 24 East Washington street; one gallon jar mixed pickles, home made; Mrs. Dr. Homer, Knightstown, silver pickle dish, worth	12

GIRLS' AND BOYS' WORK.

Fancy Bazaar, fancy goods, notions, etc., 6 East Washington street; display of needle work, by a girl under twelve years of age; Gertrude Darling, North Indianapolis, a doll worth	$ 5
Albert Gall, carpet house, 19 West Washington street; knitting, by a girl under 13 years of age; Carrie Rouse, Indianapolis	2.50
J. D. Steep, boot and shoe dealer, 5 Bates house block; pair knit stockings, by a girl under 13 years of age; Miss Warner, Brazil, pair shoes, worth,	4
W. J. Rouse, wholesale boot and shoe manufacturer, 143 South Meridian street; drawing by boy under 16 years of age, Harry Williamson, Indianapolis, pair French calf boots worth	6
Davis & Cole, dry goods, millinery, etc., Odd Fellow's Block; drawing by girl under sixteen years of age, Winnie Willard, Indianapolis, silk fan worth	2
Mrs. C. B. Ingraham, artist, 265 North Tennessee street; drawing from flat copy by child under 12 years of age, Vallette Miller, Indianapolis	1
Mrs. C. B. Ingraham, artist, 265 North Tennessee street, drawing from any object by child under 12 years, Mary E. Ingraham, Indianapolis	1

BICYCLE RACE.

First premium, A. R. Hopkins, Indianapolis, gold watch	$50
Second premium, F. M. Hatch, South Bend, silver watch	30
Third premium, A. M. Smith, Indianapolis, silver watch	15
Fourth premium, Fremont Swain, Indianapolis, pair sleeve buttons	5

Committee—R. C. McWilliams, Rockville; N. P. Richmond, Kokomo; D. B. Woodcock, Lafayette.

Boys' Riding.

First premium, George Chapman, Indianapolis	10
Second premium, Harry Atkins, Indianapolis	7
Third premium, Harry Van Hummell, Indianapolis	5
Fourth premium, James E. Sproule, Jr., Indianapolis	3

Committee—A. W. Powell, Newcastle; D. B. Woodcock, Lafayette; N. P. Richmond, Kokomo.

Diplomas.

Book 33.

18. E. A. Eickhoff, Indianapolis, 20 varieties of apples.
19. H. M. Dunlap, Savoy, 12 varieties of apples.
20. E. A. Eickhoff, Indianapolis, 6 varieties of apples.
21. E. A. Eickhoff, Indianapolis, 10 varieties of pears.
22. J. S. Boats, Spencerville, DeKalb county, 4 varieties of Autumn pears.
23. E. A. Eickhoff, Indianapolis, 1 variety of grapes, 10 clusters.
24. E. A. Eickhoff, Indianapolis, display of fruits, all kinds.
25. E. A. Eickhoff, Indianapolis, collection of nursery stock, arranged for exhibition adjoining Floral Hall.

Book 34.

1. Dr. Jas. Knapp, Louisville, Ky., general collection of fossils.
2. Natural Science Association of Indianapolis, general collection of minerals.
3. M. Z. Black, Indianapolis, general collection of shells.
4. Natural Science Association of Indianapolis, collection of fresh water shells.
5. W. J. Chambers, Kent, Indiana, collection of diurnal Lepidoptera.
6. Libbie Murry, Indianapolis, Herbarium.
7. Electa Murry, Indianapolis, Herbarium.
8. Allie Gage, Indianapolis, Herbarium.
9. Emma Caldwell, Indianapolis, Herbarium.
10. Miss Josie Aldrich, Indianapolis, Herbarium.
11. Leo Woerner, Indianapolis, collection of coins and medals.
12. Rev. G. L. Curtis, Indianapolis, exhibit in Natural History.
13. Cobb & Branham, Indianapolis, Block Coal.
14. Cobb & Branham, Indianapolis, Caking Coal.
15. Cobb & Branham, Indianapolis, Cannel Coal.
16. Cobb & Branham, Indianapolis, Coke.
17. Howard & Denig, Indianapolis, Building Stone.

Book 41.

26. Miss S. K. Rothwell, Indianapolis, dress, worsted or silk.

Book 42.

27. Mrs. Clotilde Thomas, Indianapolis, painted work.

Book 43.

28. W. Woodbridge, Indianapolis, millinery, display.
29. W. Woodbridge, Indianapolis, 2 bonnets.

Non-Enumerated.

30. Miss Emma Rawlings, St. Louis, Mo., corset and shoulder brace, display.
31. Woman's Silk Culture Association, Philadelphia, display.
32. Miss Callie Shepherd, Indianapolis, corset, display.

SILVER MEDALS AWARDED OCTOBER 1, 1881.

Wiggins & Donnan, Indianapolis, best display of stoves.
Sanders & Recker, Indianapolis, best display of furniture.
D. H. Baldwin, Indianapolis, best display of musical instruments.
Jabob C. Fox & Co., Indianapolis, best display of sewing machines.
A. R. Grimes, Indianapolis, best display of boots and shoes.
Albert Gall, Indianapolis, best display of carpets, wall paper, etc.
J. T. Kinny, Indianapolis, best display of china and queensware.
Owen, Pixley & Co., Indianapolis, best display of gents' furnishing goods.
Tyner & Hadley, Indianapolis, best display of mill machinery.
E. C. Atkins & Co., Indianapolis, best display of saws.
Robbins & Gerard, Indianapolis, best display of carriages and buggies.
Tyner & Hadley, Indianapolis, best display of plows and other agricultural implements.
Tyner & Hadley, Indianapolis, best display of agricultural and horticultural machinery.
W. C. Whitehead, Indianapolis, best display of marble and monumental goods.
The Moore Desk Company, Indianapolis, best display of office desks and furniture.
D. Kregelo & Son, Indianapolis, best display of undertakers' goods and fixtures.
William Backus & Co., Indianapolis, best display of ale, beer and porter.

REPORT OF THE FIRST DIVISION

OF THE

Committee on the Special Merits of Unpremiumed Articles,

EXHIBITED AT THE STATE FAIR, 1881,

EMBRACING SECTIONS "A" AND "B."

STATIONARY ENGINES.

The Atlas Engine Works of Indianapolis, Ind., exhibited a 12x20 stationary engine, having side valve, with hot water force pump attached to the main frame, and worked by the cross head direct. All bearings large and exposed to view. The engine is of good workmanship and fine finish.

They also exhibited a semi-portable engine, with furnace complete; constructed so that wood, straw, or even the coarsest fuel can be used. The engine being fastened to the top of the boiler. It has an internal crank, and the boiler is provided with return flues. Good workmanship is combined with durability in the engine.

Richards and Butler of Indianapolis, Ind., had on exhibition an upright engine of four-horse power, of modern design and good workmanship. It operated a feed mill made by the Nordyke & Marmon Company of Indianapolis, Ind.

TRACTION ENGINES.

C. Aultman & Co. of Canton, Ohio, had on exhibition an upright traction engine, having an independent heater, which is a great saving of fuel. It is operated by chain instead of rigid gearing, and has a variable exhaust. The engine is strong and well built.

The Harrison Machine Works of Belleville, Ill., showed a traction engine running their vibrating separator. A feature worthy of note is that the fly wheel is at the rear end of the engine, so that the engineer can, at a moment's notice, throw off the belt and stop the vibrator; a variable cut off is attached on the outside of the crank.

C. E. Merrifield & Co., of Indianapolis, Ind., exhibited a 10-horse power traction engine, manufactured by J. I. Case & Co., Racine, Wis. It has a simultaneous spur gear instead of the bevel gear, and can be readily thrown out of gear so as to run the engine without operating its trucks, and vice versa. The boiler is strongly built of best C. H. No. 1 flange iron. Drive wheels 5-feet diameter, and 8-inch face; it has the reversible link motion. The boiler has two flues, consequently the water is more thoroughly cut up, and it is a freer steamer, furnished with or without independent pump.

Gaar, Scott & Co., of Richmond, Ind., exhibited a 10-horse power traction engine. It is made with locomotive slides and cross-heads, operated by link motion and simultaneous gearing. Drive wheels 5 feet diameter, 8 inch face. Cylinder 7-inch diameter and 11-inch stroke. Engine and boiler are of modern design, works smoothly and well.

The Atlas Engine Works, Indianapolis, Ind., had a portable engine with traction attachment on exhibition. Drive wheels 4-feet diameter, 8-inch face, made of wrought iron, a wrought iron tank is attached to the boiler. The engine is attached to the side of the boiler, is of new design, driven by chain instead of rigid gearing, the pulling atttachment is provided with a steel coil spring to prevent sudden jerks when pulling heavy drafts.

Marks & Stroh, Crawfordsville, Ind., showed a traction engine of their manufacture, a peculiarity being a concave worm gear attached to the main axle, geared with beveled wheels from the main shaft, which operates smoothly and powerfully. The steering arangement is directly attached under the boiler to operate the front wheels, and is held rigid, and can be turned any angle. The engine is simply and powerfully constructed. Internal cranks run the simultaneous or detached governor. 12-horse power, drive wheels 5 feet diameter, 12-inch face.

The Eagle Machine Works, Indianapolis, Ind., exhibited a 10-horse power traction engine, operated by simultaneous gear. The engine is reversed by cam gear, doing away with the complicated link motion, has circulating fire-box boiler, is of good workmanship. Drive wheels 5 feet diameter, 6-inch face.

Nichols, Shepard & Co., Battle Creek, Mich., showed a 10-horse power traction engine having simultaneous rigid gear. Drive wheels entirely of wrought iron, 4 feet diameter, 8-inch face. Reversing the engine is accomplished by means of a loose sleeve on the main shaft attached to a lever which is readily operated by the engineer. The gearing is of steel, cut by machinery, doing away with the link motion and which simplifies the machinery. The main shaft is run in gun metal boxes. The engine has locomotive slides and cross-head. The boiler has 35 flues 2 inches diameter, 66 inches long; and has 135 square feet of heating surface; cylinder is 7x10 inches

Russell & Co., Massillon, Ohio, had on exhibition a 10-horse power traction engine with simultaneous rigid gear. Drive wheels part wrought and part cast iron, 4 feet diameter, 6-inch face, can be operated by sleeve and spur wheels by a lever attached thereto and easily operated by the driver. Has locomotive slide and cross-head. The pump acts direct from the cross-head. The engine is attached to the side of the boiler. The boiler is of good material and has a circulating bottom.

Richards & Butler, Indianapolis, Ind., showed a heavy traction engine, 14-horse power, with water tank attached under the boiler. It has simultaneous spur gearing and locomotive link motion.

PORTABLE ENGINES.

C. E. Merrifield & Co., Indianapolis, Ind., exhibited an Atlas Works 10-horse power threshing engine. Among the peculiarities of its construction is a combined safety valve and stop cock, operated in a peculiar manner to overcome the bursting of the heater pipe, which so frequently occurs in consequence of the engineer being too hasty in starting up the engine. The cross-head and piston rod is fitted without key or pin and is carefully bored out and threaded, and has a jam nut before it to hold it firmly to its place. The governor used is easily changed from one speed to another.

Frey, Sheckler & Hoover, Bucyrus, Ohio, exhibited a portable engine having locomotive slide and cross-head, the main frame of the cylinder being detached from the main shaft to overcome expansion and contraction of the boiler, so as to keep the engine in perfect line. It is of good workmanship and material.

Chandler & Taylor, Indianapolis, Ind., exhibited a 10-horse power portable engine. A peculiarity in its construction is, that the water heater is attached to the bottom of the boiler, exactly over the front axle, and forming a pivot on top of the axle, thus simplifying the machinery. It also has a super heater in front of the smoke box, thus enabling the engineer to work the steam perfectly dry and keep the boiler from foaming, so as to use the dryest steam in the cylinder and not interfere with the oil in the cylinder. The bed plate is of new design of the Harris-Corliss make. The cross-head is easily adjusted, the whole consisting of only two parts. The workmanship is good.

A. C. Hamilton & Co., Indianapolis, Ind., exhibited a 10-horse power threshing engine, manufactured by Seymour, Sabin & Co., Stillwater, Mich. The engine is simply and strongly built and has a steam pump attached. The boiler is constructed without return flues, thereby increasing the heating surface in less space and materially lightening the weight of the boiler, also making the steam dry and more latent with less fuel.

Messrs. Hamilton & Co., also exhibited an 8-horse power threshing engine, manufactured at Watertown, N. Y. The bed plate is attached to the top of the boiler, and has an internal crank. The fly wheels and band wheels are at each end of the main shaft, thereby balancing the weight on the trucks.

Rinehart, Ballard & Co., Springfield, O., showed a 10-horse power steam engine and steam pump, constructed with a rotating valve, no steam chest being used; the steam passing direct from the boiler to the cylinder prevents lost motion, and there is no back pressure. The slide and cross-head is of locomotive style. A great saving is accomplished by using a rotating valve, as no kind of pressure interferes with the valve and cam rod. The engine also has a detatched steam pump.

Robinson & Co., Richmond, Ind., had on exhibition a 10-horse power farm engine, with locomotive slide and cross-head. The engine is attached to the side of the boiler. It has a hot-water pump and stop governor. If the governor belt should break the engine would be stopped immediately. It also has an exhaust regulator and spark arrester, completely controlling the sharpness of exhaust steam.

The boiler has 28 flues, 2¼ inch diameter, 62 inches long; the cylinder is 6½x12 inches; the heating surface flues is 86 feet, fire box 17 feet, grate 4½ feet.

The engine is of modern design, shows good workmanship, and works smoothly.

The grate bar is so constructed as to almost double the area of fresh air to pass through the grate. Its lightness fully compensates the durability so sustained, and guarantees full combustion.

A saw attachment to the engine is a notable feature. It is portable, easily handled and carried along without being detatched from the engine.

Vinton & Zschech, Indianapolis, Ind., had a 10-horse power portable engine, of Sinker, Davis & Co.'s manufacture, to run their pony saw mill. The engine has locomotive slide and cross-heads; the valve movement is direct from the cam. The boiler is constructed with a camel-back, which affords a greater number of flues, and gives more heating surface in a more compact form, cutting up the water so completely that evaporation goes on freely and successfully. It has a square fire box with open grate surface, thus deriving a better combustion of fuel. The engine and boiler are of new design, simple construction and well built.

M. & J. Rumely, Laporte, Ind., exhibited an 8-horse power portable threshing engine, with locomotive slide and cross heads; the hot water pump driven by the cross head; valves double seated. The boiler is of good material and workmanship. The spark arrester is of peculiar construction, and set to do its work complete, so as to prevent the possibility of fire by the operating of the engine near straw-stacks, etc.

The Eagle Machine Works, Indianapolis, Ind., had a 10-horse power portable engine, with locomotive check, and cage valves, with a force pump attached. The boiler has a circulating fire box, all of good material and workmanship.

Russell & Co., Masillon, Ohio, exhibited two 10-horse power portable engines, of new design, locomotive slide and cross head, hot water pump operated by cross head direct. The boiler has a circulating bottom, all well and substantially built.

Sinker, Davis & Co., Indianapolis, Ind., had two 10-horse power portable engines operating the shafting in reaper hall. Both are of modern design, well made, and of good material.

Nichols, Shepard & Co., Battle Creek, Mich., exhibited a 13-horse power portable engine, of good design and workmanship, having a force pump attached, operated directly from the cross head, the main shaft in gun metal boxes. The straps on the connecting rod are well secured by bolt and key. The engine has locomotive slide and cross head. The boiler is of good material and well made. Cylinder 8x12 inches; length of fire box, 36 inches; height, 37 inches; width, 25 inches 42 flues, 2 inches diameter, and 66 inches long.

FORCE PUMPS.

R. R. Rouse, of Indianapolis, had a 2-horse power Baxter engine, operating his driven well pump, which supplied a number of engines on the grounds with water. He exhibited a number of wooden and iron pumps.

L. D. Railsback, Indianapolis, Ind., exhibited a single acting force pump, having glazed cylinder. The sucker is simple and complete in construction. By an attachment it can readily be operated or changed to a force pump, the barrel being provided with air hole on the side. By screwing down the nut the air hole is closed and it becomes a force pump.

The double acting force pump exhibited by the same party is supplied with a rod so constructed as to give it two fulcrums, which makes the pump double acting, with half the leverage of other pumps.

The Kanaval Force Pump Co., Mansfield, Ohio, single acting, double chambered force pump of modern design and good workmanship. It takes the water from the top, is non-freezing, and the price of it is within the reach of any farmer.

John P. Martin, No. 125 E. Pearl street, Cincinnati, Ohio, exhibited Martin's red jacket force pump, having a porcelain cylinder, and being non-freezing. It is of good design and well made.

E. C. Taylor, Indianapolis, Ind., exhibited his cattle and stock pump. It is constructed with a platform, which has a counter balance outside to bring the plunger and that part of the platform up in its true balance. At the opposite end of the counterbalance of the platform is the well, provided with a trough and a chute or railing, wide enough to admit a horse or cow on the platform. The trough extending beyond the railing on either side admits of two head of stock drinking at the same time, and the surplus water runs into a lower trough for hogs or sheep. The pump is worked by the weight of the cow or horse standing on the platform. Instead of the plunger bringing the water up, the weight forces it down and into the trough.

It is perfectly self-regulating, ready at all times, and non-freezing.

WIND ENGINES.

Smith & Woodard, Kalamazoo, Mich., exhibited their wind engine, for which is claimed simplicity and durability. It is provided with a wooden lever and adjustable weight to regulate the speed of the mill as desired.

All the gearing is enclosed from sleet and snow, and does not interfere with the working of the mill.

It has only two points of friction, one on the bearing of the main shaft and the other on the wrist pin.

It is mounted on chilled rollers perfectly encased.

The Perkins Wind Mil Co., of Mishawaka, Ind., exhibited their mill, they claim for it strength, durability and ease of government to the winds.

Its peculiar points are, the wheel being on one side of the centre admits of the wheel regulating itself without weights, except the weight of the rudder. It has two bearings on each side of the pitman, which keeps the shaft in perfect line. It is strongly built.

Flint, Walling & Co, Kendallville, Ind., had on exhibition a wind mill of their manufacture, having a direct pump rod connection, perfectly balanced with or against the wind when in or out of gear. It is so constructed that the fan when with the wind completely balances the mill.

The brake is peculiarly constructed, and is positive and holds the wheel perfectly still, and is self-governing.

Koontz Bros., South Bend, Ind., showed one of their wind mills, an important feature of which is the fastening of the sails on the vane with wire fastenings, it is provided with a rigid lock and guarded against damage by winds in storms. It can be regulated to any speed by the governor.

Fairbanks & Co., Indianapolis, Ind., exhibited one of their wind mills having two vanes, the smaller one acting to regulate and to take the mill out of the wind. The large vane is larger than on other mills and holds longer and steadier into the wind and gives more power. The wheel is in sectional pieces and fastened with maleable tips on each section, the bone of the vanes are suspended on wrought iron tubes, which makes it durable and strong.

Mast, Foost & Co., Springfield, Ohio, exhibited their wind turbine wheel, which is composed of wrought and cast iron and brass vanes. The fans discharge the wind to the centre of motion and give more power; they are well braced, having a double set of arms inserted in a malleable iron sleeve firmly screwed in. It is self-regulating and self-oiling with a positive stroke to the pump.

They also exhibited a double acting force pump, with porcelain lined and glazed cylinder, two pistons, no packing, non-freezing tubular air chambers. The price of their pump is within the reach of any farmer.

The Adams Wind Engine, manufactured by the Marseilles Manufacturing Company, Illinois. A. C. Hamilton & Co., Indianapolis, Ind., Exhibitors, is claimed to be absolutely self-governing. The fans are operated by balls in front of the wheel and connected by rods to a heavy spring which governs the fans automatically to any force of wind or storm. This governs the speed of the wheel completely.

The mill is so constructed that snow or sleet cannot interfere with the working part of the engine. When thrown out of the wind the wheel stands perfectly still.

THRESHERS AND SEPARATORS.

Rheinhart, Ballard & Co., Springfield, O, exhibit one of their vibrating threshers, having a grate back of the cylinder to prevent the straw from striking the rakes and going out with too great a force, and gives ample time to do good separating. They do away with ratchets, spools and straps, and regulate the rake teeth by using malleable iron rocker with a slot giving positive motion by adjusting the same at will.

They have the best C. H. iron teeth for their rake instead of wooden teeth.

After the straw and chaff leaves the floor, the chaff and grain drops into a perforated bottom and the straw is carried away by vibrating rakes, and the chaff and grain then falls into the riddles and is completely separated.

An iron beater back of the cylinder obviates the possibility of damp straw wrapping around, they also have an arrangement to regulate the wind on the riddles for any kind of straw.

J. I. Case & Co., Racine, Wis., exhibited their agitator which has many features worthy of mention. The grain conveyor and straw conveyor being separate, and counterbalancing each other, power is applied from each side by crank and pitman.

The straw conveyer has an upward and forward motion so as to lift the straw and let the chaff and grain fall through the lower conveyer.

The movement of the shoe, which is very rapid, agitates the riddles perfectly and obviates choking.

The fan is an underblast and produces a mild current of air so as to overcome the blowing over of light grain. A large beater is just back of the cylinder. The machine is operated by three belts; it has side shaped roof to shed water from each side; it is simply constructed and well built.

The Minnesota Chief Thresher, was exhibited by A. C. Hamilton & Co., Indianapolis, Ind. They claim it to be the simplest thresher built. It has an open grate back of the cylinder so as to facilitate the separation of grain and chaff from the straw before it goes onto the apron, which is of one piece without fingers or shafts. A beater back of the grate serves to keep the straw down on the apron and keep it thoroughly agitated. It has an overshot fan, and an easy and practicable way to regulate the wind into the fan. It has but few belts, and all are on one side. It has a large separating capacity, is neatly and strongly built.

The Harrison Machine Works, Belleville, Ill., grain thresher, claim extra width and length. It has pickers above the straw which agitates it thoroughly, and completely separates it from the chaff and grain before going onto the shoe. The fan is large and produces a mild draft under the riddles. It is operated by five belts, of good workmanship and finish, and well and strongly built.

Tyner & Hadley, Indianapolis, Ind., showed the Victor Double Huller and Clover Machine. Both cylinders hull and use rasp teeth. The concave and teeth in the cylinder have rasp sides, therefore, if the clover gets between the teeth of the concave and the cylinder a thorough friction is accomplished.

C. E. Merrifield, Indianapolis, Ind., showed a C. Aultman & Co.'s thresher and separator. A short grain apron is used to carry the straw, grain and chaff onto the vibrating table. Five beaters thoroughly separate the grain and chaff from the straw. The separating surfaces are of extra width, which facilitates separation. The machine has a very good attachment for changing the current of air under the fan to suit dry or wet grain.

Combination riddles separate all kinds of grain except flax or timothy. The extended riddle bears off all chaff onto the carrier with the straw. The stacker has a movable floor, which, when opened, lets the chaff drop through while the straw is carried onto the stack.

On top of the shoe is an end shaped shoe, which catches chaff and grain and carries it back to the shoe.

The grain is registered by a simple device.

The elevater is provided with a partition at the lower end to prevent the clogging of the lower elevater pulley by damp chaff or grain.

The tailing shoot is provided with a screen to carry off grain back of the cylinder, and chaff and white heads in front of it.

The Upton Manufacturing Company, of Battle Creek, Mich.; thresher; is provided with a comb and shield back of the cylinder, which prevents wrapping of straw when damp, and also guards against the throwing of grain and straw in front of the apron. It has a vibrating shoe, and a balancing pendulum. A large overblast fan makes a light current of air on top of the riddle, which is large. The fender board is hung on hinges, and can be regulated at will in any kind of grain to prevent grain being blown out onto the stack. The elevaters discharge at the bottom instead of the top, thus preventing clogging. The agitating floor has three sets of rakes, and back of them is a beater. The machine has large capacity and is of good workmanship.

Robinson & Co., Richmond, Ind., manufacturers of the bonanza thresher, exhibited one of their machines. A concave of solid metal is constructed on both sides of the cylinder, which is much better than sheet iron. A good device is provided on each side of the journal boxes for taking up end or lateral motion without stopping the machine, which may be easily regulated so that the teeth of the cylinder will pass through the teeth of the concave equi-distant and prevent the cracking of grain. The outside bearing of the cylinder shaft is provided with an adjustable stay rod, so that when a strain of the belt is brought to bear on the pulley, the shaft is kept perfectly straight, thus preventing the heating of the journal boxes. The floor of the stacker is vibrated so that if any grain should be retained in the straw, it is brought back to the end of the shoe which has an extension under the tailing spout, and carried back through the elevater to the cylinder. A sectional apron back of the cylinder opens to the volume of straw received on the apron, which overcomes the throwing of grain ahead onto the apron. Three pickers are combined with the apron, which reach back through the sectional apron and keep the straw from clogging on the cylinder.

The clover hulling attachment to the above machine consists of a peculiar concave, which takes the place of the common concave, and hulls the clover in a most desirable way. It is so arranged that it can be replaced at will, and the whole, or part of it, be made clover hulling while the machine is in motion. It is easily arranged, simple and effective.

Gaar, Scott & Co., Richmond, Ind., exhibited a vibrating thresher. Some of its peculiarities are, that the separation commences through the open concave at the point where the first heads are threshed.

The grain, as fast as threshed, is driven downward through the open grate onto the conveyer. The beater arrests the straw and the small amount of grain intermingled with it, and turns or beats it down onto the separating pan. The lifting fingers take the straw and toss it up, and, as it falls, the next set of fingers repeat the operation, and the straw passes from the machine to the stacker.

As fast as the grain is separated it falls onto the bottom of the conveyer and passes smoothly along till it comes to where it is sifted through openings in the conveyers to the riddles in such manner as to allow the wind to strike it while it is separated, or divided into small quantities over a large surface of the riddles, thus making it easy to clean with a moderate blast of wind.

M. & J. Rumely, Laporte, Ind., had on exhibition a separator of their manufacture. The concave of this separator is so made that large quantities of grain pass immediately to the grain belt from the cylinder, thus overcoming in a great measure the cracking of grain. As the straw leaves the cylinder it passes under a heavy beater which thoroughly scatters the straw, which is often fed in bunches by inexperienced feeders.

The straw when at the end of the grain belt comes in contact with another beater revolving with sufficient speed to throw the straw up to the decking, causing a fall of from fifteen to twenty inches before striking the rake. The rake agitates the straw so thoroughly as to prevent any grain from passing out with the straw.

Separators are so incased that the wind can not strike the straw or chaff until it issues from the top of the straw stacker.

The shaking of the riddles is effected by two cone pulleys. By shifting the belt upward or downward it will change the shake of the shoe momentarily.

The separator is strongly built and of good workmanship.

The Eagle Machine Works of Indianapolis, exhibited their oscillator. It has a thirty-two inch cylinder and forty-four inches separating capacity. Back of the cylinder is a beater, which agitates the straw thoroughly to separate it from the chaff and grain, before it is carried on to the oscillating floor, which consists of four sections, slatted with iron, which gives it a free separating surface.

Back of the beater are agitating fingers to thoroughly shake the straw as it passes to the oscillating floors. Back of these fingers is another beater working the reverse of the one in front. Instead of getting the straw under, it lifts it from the oscillating floors and gives it a good beating. Back of this is another shaft with fingers which shakes out all remaining grain on to the shoe. Under the oscillating section floor is a vibrating table which receives grain and chaff and carries it toward the shoe. Just above the shoe is a perforated floor which distributes the grain and chaff on to the riddles evenly. The shoe is of a side shake. The machine is of new pattern, good design and workmanship.

Russell & Co., Massillon, O., exhibited the Massillon Thresher. Cylinder thirty-three inches, separating surface forty-four inches. A new feature in their machine is the arrangement of the fingers or shaking bars, they being more similar to the natural mechanism of man than any used on other machines. It consists of a crank shaft so arranged and constructed as to do the work in a most complete and practicable manner.

The crank shaft is entirely guarded by heavy sheet iron guards to prevent wrapping when the straw is damp. The agitating floor is made of iron and wood slats, and completely separates the chaff and grain from the straw.

The lower grain floor is part solid, and discharges the chaff and grain back to the shoe, which is of end motion, with large cleaning capacity.

Messrs. Russell & Co., also had the separator which they exhibited at the Centennial, set up in the main building. It is very highly finished.

A. Birdsall, South Bend, Ind., had on exhibition a clover huller. This machine is of good workmanship, and does its work exceedingly well. Its merits are well known all over the State.

SAW MILLS.

Chandler & Taylor, Phœnix Machine Works, Indianapolis, Ind., had on exhibition a Mulay Saw Mill of their manufacture. The mill has a solid iron frame, compactly built, of good workmanship. Can be operated by a 10-horse power engine, and cut 2,500 to 3,000 feet of lumber a day with three men.

Eagle Machine Works, Indianapolis, Ind., exhibited a Standard Double Saw Mill, having regular friction feed, made for sixty and thirty inch saws. The mandrel has no side bearings. The mill is very well built. The head-blocks are forty-nine inches between saw and knee.

They also exhibited a heavy double Pony Saw Mill for fifty-four and twenty-eight inch saws. It has outside bearings, is nicely constructed and of good workmanship.

The same firm also had in operation a single pony saw mill with a 54-inch saw 8 gauge, running successfully and doing good work through various kinds of logs. Operated by a 10-horse power engine.

The improved Minor Head Blocks with simultaneous movement, taking 40 inches between saw and knee, was used with their mill.

Also the plantation saw mill exhibited by this firm was of new design and first-class workmanship, it takes a 48-inch saw.

The Eagle Head Blocks, of good pattern and having 36 inches between knee and block, and a set of their Craney dogs, well known as being first-class in pattern and make, attracted considerable attention.

Russell & Co., Massillon, Ohio, exhibited a single pony saw mill, with 30-foot carriage, combination lever set head blocks. The mandrel has three adjustable bearings secured to frame. The mill is operated from the front of the saw instead of the outside of the carriage. It is run by regular belt and friction feed. It has a 52-inch saw with inserted teeth. The mill is well built, durable and of good workmanship.

Vinton & Zscheck, Indianapolis, Ind., had on exhibition one of their new pony saw mills, of modern design and good workmanship, the important feature of which consists of forged crucible machinery steel mandrels with long bearings to overcome friction and the heating of journals.

The saw mill was supplied with the celebrated patent saw guide which is novel in construction, and obviates the liability of the sawyer getting his fingers or hand mutilated while trying to give the saw lead.

It is also provided with a compound automatic top saw belt tightener. No matter how deep the upper saw is cutting into the log, it will keep in uniform speed with the lower saw.

The carriage trucks are made self-oiling with wrought iron axles, which are well fitted and strong. The Head Blocks are simultaneous and independent, 44 inches between saw and knee. The knee is operated by a screw, and sets the log up in thirty-second parts of an inch.

TILE MILLS AND BRICK MACHINES.

Nolan, Madden & Co., Rushville, Ind., exhibited a tile mill having quite a new feature, consisting of a revolving cut-off, which facilitates the making of all kinds of tile, and sets them on end without being touched by the off-bearer till carried away.

The Clay Crusher, exhibited by the same parties, is provided with chilled iron rolls, and a combination of gearing so as to work easy. It prepares the clay and pulverizes any stone that may be intermingled. It can be operated by from two to three horse power.

Frey, Stuckler & Hoover, Bucyrus, O., showed one of their tile mills. It has a large capacity for clay mixing; it has two shafts running in opposite directions, thus preventing the clay from turning or twisting while issuing from the die. The improved cutting table, operated by its own motion, is easily adjusted to any height and has a rocking motion. The mill makes tile from two to eighteen inches, of any form.

The same parties exhibited a brick machine, which is easily operated by a ten-horse power engine. It works well with good or inferior clay, and makes brick of any form or size by changing the dies.

Chandler & Taylor, Indianapolis, Ind., exhibited a tile mill of new design. The forcer or plunger consists of three parts, and lets the clay fall into the chamber without any obstruction; by this means it fills the clay chamber completely, and makes a good, solid tile. It is easily adjusted for making brick, can be operated by horse or steam power. The mill is durable and well built.

Fletcher & Thomas, Indianapolis, Ind., exhibited a brick machine, said to be the most complete machine in the market for its purpose. Its capacity is 25,000 brick per day with a force of twenty-five hands. The machine was operated by a twelve-horse power Atlas engine.

MISCELLANEOUS EXHIBITS.

Straw Stacker. M. T. Reeves & Co. of Columbus, Ind., exhibited a straw stacker of new design, which is claimed to do the work of from 4 to 6 men in stacking straw, and to make a stack to stand any weather. It distributes the straw and chaff evenly over the stack. It is operated by the threshing machine to which it is attached, and can be easily adapted to any thresher.

Patent Whiffletree and Equalizer. M. L. Wagner of Anderson, Ind., had on exhibition a patent whiffletree, which is also a draft equalizer for a double team for light or heavy drafts. The device is simple and meritorious.

A Feed Grinding Mill was exhibited by *A. C. Hamilton & Co., Indianapolis, Ind.* It has a capacity of grinding 20 to 25 bushels of grain per hour. It is simply constructed, and cheap. The burrs are of cast steel, the face being cut adversely to each other, thereby cutting the corn first and then grinding it.

A Flour Bolt and Purifier was exhibited by *Riley Bond of Indianapolis, Ind.* It is claimed that wheat and corn can be bolted and purified by this machine.

The LaCroix Middlings and Purifier Co. of Indianapolis Ind., exhibited one of their dust collectors. By use of this machine, spouting in a mill is done away with, as it collects all dust and transfers it to the conveying box.

Robinson & Co., Richmond, Ind., had on their engine one of their governors which is provided with an elastic spring to regulate the speed of the engine. It also has a practical attachment to make it a sawyer valve at will.

Stump Pullers. James Mossman, Westerville, O., exhibited two stump pullers, consisting of a sheave and a hook with a combination lever, sheave, stirrup and pall, using ¾ inch proof chain and a grab hook to take hold of the chain. It is moved by plank runners, and with it one man can lift thirty tons.

Road Cart. W. S. Frazier & Co., Aurora, Ill., exhibited two road carts. They are convenient for a single seated business rig, or to use with young horse, or in breaking colts. The seat can be made for two persons if desired. They are neatly and strongly built and quite a novelty, easy to ride in and cheap.

Minturn & Smith, Warsaw, Wis., exhibited an automatic safety cylinder cock, consisting of a composition conical seat; the stuffing box is in front of the cock, between the stuffing box and disk is a spiral spring which under certain pressure relieves the pressure of the cylinder.

The stuffing box is so arranged that the spring can be adjusted so as to carry different pressures to the cylinder.

Hay Rakes. John H. Thomas & Son, Springfield, O., exhibited their steel tooth and wooden tooth hay rakes.

Machine for Bottling Beer. Wm. Backus & Co., Indianapolis, Ind., exhibited their bottling machine. It is provided with a brass strainer, the valves are so constructed that when bottles are hung on the outside tubes the weight of the bottles open the valves, and as soon as the bottle is filled and taken off the tube, the valve closes of its own accord.

The Philip Best Bottling Co., of Milwaukee, Wis., exhibited a full assortment of their bottled beer.

Their process is peculiar and meritorious. The beer is bottled without the steaming process, which does not change the taste, and prevents it from souring under changes of temperature.

Your Committee on Special Merits of Sections A and B, would respectfully suggest that machinery on exhibition should be so classified and arranged that your committeemen need not conflict in the discharge of the duties assigned them, And to the end that your exhibitors will, by the competition thus engendered, derive greater benefit than if certain classes of machinery is scattered over the Fair grounds.

Hoping our report will meet the approbation of your honorable body, and that your exhibitors and patrons may derive benefit from same,

We are very respectfully, yours, etc.,

GUSTAVUS ZSCHECH,
S. L. KINGSBURY,
Committee.

REPORT OF THE COMMITTEE

ON THE

Special Merits of Unpremiumed Articles, Entered in Book "E,"

AND

Exhibited at the Indiana State Fair, September, 1881.

Book E embraces Tools, Machinery, and other Implements used in cultivating, gathering and preparing crops for market, or for domestic use. This group of agricultural agencies contains the most important instruments concerned in farm production, and covers the most advanced points of those modern improvements which have added so largely to the productiveness of farm labor. This is naturally divided into—

First—Cultivating Implements.
Second—Harvesting Machinery.
Third—Tools for Stock-feeding.
Fourth—Unclassified Devices.

CLASS I.—CULTIVATING IMPLEMENTS.

SECTION 1.—PLOWS AND CULTIVATORS.

Butcher, Gibbs & Co., Canton, O., exhibited fifteen plows of different sizes, designated by numbers, but all of the same pattern. Part were of steel and part of chilled iron—all highly polished. In their construction these plows had their parts so arranged that any piece of any plow would fit any other plow of the same number, whether it be steel or chilled iron; and the parts are so fastened by screw-bolts that any part may be replaced, or exchanged without taking the plow to the shop. The plows are of good pattern for the several purposes for which they are intended—of good material and workmanship and completely finished.

J. P. Warner, Dowagiac, Mich., exhibited a 2-horse spring-tooth cultivator, in two sections, acting independently of each other.

Also, 1-horse spring-tooth cultivator, for working in corn, of a larger size. These are excellent tools for destroying weeds, and mellowing ground that has been properly broken.

P. P. Mast & Co., Springfield, O., were the manufacturers and exhibitors of a large and well assorted collection of cultivating implements, consisting chiefly of

A double, spring-tooth cultivator, with sulky wheels and riding arrangement attached. It is designed for two horses in corn cultivation.

Also, a combined riding or walking, 2-horse cultivator, with four shovels and revolving shields to protect the young corn.

Also, a walking 2-horse cultivator, with springs to elevate or depress the shovels.

Also, a sulky attachment by which a common hand plow may be used as a sulky plow in smooth ground, and detached and used as a hand plow in stumpy or rough ground.

These implements are well formed, of good material and creditable workmanship.

The Weir Plow Co., Monmouth, Ill., by their Indianapolis branch house, exhibited a very large and complete collection of plows and cultivators, embracing most of the late improvements in this line of farm tools. First were,

Three sulky plows, with share, mould board and landside made of tempered steel, highly polished, and to each is attached a revolving coulter. The driver in his seat, by moving a lever, connect the team with a gearing that lifts the plow out of the ground by horse power, and holds it there at will. These three sulkies are a general purpose plow, a sod plow, and a stubble plow.

A steel plow with iron beam, 16-inch cut.

A similar sod plow, 12-inch cut.

A general purpose plow, center draft, 12-inch cut, wooden beam, steel or chilled casting, as desired.

A steel sod plow, wooden beam, 14-inch cut.

A steel general purpose plow, 14-inch cut.

These wide cut plows are intended for three horses, and an equalizing tripletree is attached, so that the draft is equal on each horse. The wheels of the sulkies have each a movable box of chilled iron which can be replaced when worn, without the necessity of supplying a new wheel.

A walking, two-horse cultivator, with steel rod spring so operating as to press the shovel into the soil when down, but to hold it up when raised.

Also, the same cultivator without springs, and a sulky cultivator with a wooden frame and iron shovel shanks.

Jefferson Taylor, Indianapolis, exhibited a series of plows, consisting of eight plows of the "Oliver Chilled" pattern, ranging from one horse up to three horses in the force required to operate them. They are complete, individually and collectively.

Also, two Cassady sulky plows, the one of steel, with a revolving coulter, the other of chilled iron with a pointer. The peculiarity of this plow is the absence of a landside, the inclination of the land wheel preventing the side thrusts, and thus the friction of a landside is saved.

Also, a walking, two-horse cultivator, high axle to accommodate large corn. Draft arranged below the axle and operating directly on the shovel beams, so as to force them into the ground uniformly.

A. H. Meal, Indianapolis, showed three diamond steel plows, Nos. 5, 6 and 7. They are of very fine workmanship and substantially made.

Also, three chilled, cast iron plows, Nos. 4, 10 and 15. Shares and mould boards highly polished.

Also, two iron frame, double shovel corn plows—strong and light.

W. J. Wooley, Galveston, Ind., exhibited a double shovel corn plow, with an iron frame, and a similar plow with a wooden beam, and also a single shovel corn plow, with iron frame and a twisted hook firmly attached to the end of the beam. A feature of special merit in these plows is, that the handles are adjustable to any height to suit the convenience of the plowman.

W. K. Sproule, Indianapolis, had on exhibition the Beard's steel plow, the successor of the old "Beard and Sinex steel plow," the pioneer of this class of plows, so well and favorably known in this State twenty years ago. The pattern and workmanship retains its excellence. The old model has acquired a modern clevis by which the depth and land is effectually regulated.

Also, a steel, one horse corn plow of the bar share pattern.

Also, the Long & Allstatter (Hamilton, Ohio,) cultivator, to which may be attached right and left bar shares, bull tongues, or common shovels, as circumstances may demand. The axle is adjustable, so that each horse operates independently, and the plows are always in line.

Also, Hugs' sulky plow, (Long & Allstatter). This is a three horse plow, two horses walk on the land and one in the furrow, and both wheels of the sulky run on the land, and the plow is attached to the side of the carriage.

J. M. Buchannan, Indianapolis, showed a heavy road plow, constructed entirely of wrought iron and steel, except the handles. It is strong, well made and admirably adapted to the purpose for which it was designed.

George W. Brown, Galesburg, Ill., exhibited a sulky with adjustable wheels, to which any walking plow may be attached that is adapted to the work to be done.

Also, Brown's two horse, walking cultivator. The shovels are elevated and held up when not in use by spiral steel springs. The tongue is flexible, and each horse draws directly on the axle, by which arrangement side motion from unequal draft is avoided.

D. C. & H. C. Reed, Kalamazoo, Mich., had on exhibition a compound implement, consisting of a spring tooth cultivator in two sections, and a broad cast seeder attached. This last may be detached and the spring tooth cultivator used either in single or double sections.

Also a one-horse spring tooth corn cultivator and seeder for corn rows. These are durable and convenient implements, and will do good work.

Furst and Bradley Manufacturing Company, Chicago, Ill., by Indianapolis branch house, exhibited a complete group of plows for all purposes required on the farm, among which we note a steel breaking plow, fourteen-inch cut; a general purpose plow made entirely of steel except the handles; a three-horse chilled iron plow, of very high polish; a sulky plow made entirely of Bessemer steel. It cuts and turns sixteen inches, has a revolving coulter. The sulky carriage to which this is attached has iron wheels forty inches high. The plow is lifted out of its furrow by the team, when desired, by means of a band lock, operating on the hub of the wheel. It is designed to be operated by three horses, and will do very thorough work.

Also, a combined riding or walking two-horse cultivator, of excellent design and workmanship.

E. Over, Indianapolis, exhibits a pointed shovel cultivator, an implement that will adapt itself to a variety of work in rough ground.

The South Bend Iron Works, by their Indianapolis agency, exhibited samples of the Oliver Chilled Plow and Sulky. This is, perhaps, the largest plow factory in the nation, and their work is sold in almost every market of the civilized world. The method of chilling cast iron so that it will be as hard, and receive as high a polish, as highly tempered steel, has been successfully applied in the construction of the Oliver Chilled Plow, so that the exposed parts of the plow wear slowly and are not disposed to rust. This shop manufactures every form of plow that the markets of the world demand, and the quality of the work which they send out is too well known to need commendation now.

Tyner & Hadley, Indianapolis, exhibited two Champion Sulky Plows, adapted to three horses. They are of tempered steel, well formed and highly polished. Also, a Mishawaka Sulky Plow for two horses.

Also, a collection of 25 Champion Steel Plows of various styles and adapted to every variety and condition of soil.

Also, five Mishawaka Steel Plows, embracing sod, stubble, and general purpose plows, and besides these are several chilled iron plows from the Mishawaka factory. Altogether, this house exhibited a very creditable display of plow machinery kept for sale at their house in Indianapolis.

SECTION II.—PULVERIZING AND PLANTING IMPLEMENTS.

J. P. Warner, Dowagiac, Mich., exhibited a mounted spring tooth harrow in three sections. Six springs to each section. The sections are adjustable, so that one or all may be used at a time. Attached to this harrow is a broad-cast sower, which may be detached and the harrow used alone. The broad-cast attachment sows a land six feet wide, and will distribute the grain more evenly than is commonly done by hand.

Mechanicsburg Machine Co., Ohio., exhibited an iron frame seed drill with 8 hoes' which are forced into the ground at uniform depth by means of steel springs.

P. P. Mast & Co., Springfield, Ohio., showed a grain drill which for the ordinary hoe substitutes a shoe, somewhat resembling the runner of a corn planter. These are forced into the ground by spring pressure so that the grain is planted at a uniform depth.

Also, the same parties have a force-feed hoe drill with springs attached to the hoes, and with a distributer of fertilizers.

Also, two wheat drills for corn rows; one with five hoes and one with three hoes. For seeding among standing corn these drills are well adapted.

Jefferson Caylor, Indianapolis, had on exhibition Stoddard & Co.'s grain drill with an attachment for distributing commercial fertilizers. Either can be used without the other. The feed can be changed at any time without changing the feed wheel.

Also, Randall's pulverizer consists of twelve steel disks revolving in a line at an angle of 30° to the line of the direction of the implement. A good tool where the clods are not very hard.

Also, three corn planters of different styles, to-wit: A drill adapted to one horse, and to planting a single row; a combination, two-horse drill and planter, adjustable to a drilled row or to planting in hills at pleasure, plants two rows; and the same without the drill attachment.

Also, A three leaf, folding harrow, having fifteen steel teeth in each leaf. Teeth adjusted to such an angle as to prevent choking in rough grounds. It covers a land seven and one-half feet wide.

B. S. Williams, Kalamazoo, Mich., showed a wheat drill and a spring harrow combined and so arranged as to scatter the seed as it drops it, and leave it either on the ridge or in the furrow, as the farmer may choose.

Johnson, Gere & Co., Owego, N. Y., exhibited the champion wheat drill, a very complete implement, with grass seed and fertilizing attachments, and adjustable for planting two rows of corn, thus combining several indispensable farm implements in one. It is strong, well constructed and will not be liable to get out of order. The hoes are held to their work by rubber ball springs.

D. McSherry & Co., Dayton, O., had on exhibition, by S. H. Denny, Indianapolis, three seed drills, to-wit:

1. An eight-hoe, wheat drill with rubber ball springs maintaining pressure on the hoes, and a grass seed attachment.
2. The same drill with an appendage for distributing commercial fertilizers.
3. A wheat drill for corn rows, five-hoes. The drill adjustable to any width of row.

All these drills have the spiral force feed.

W. K. Sproule, Indianapolis, showed a seed drill with fertilizing combination, detachable; so that either can be run singly, or both together. A very convenient implement.

M. Gibbs, Homer, Mich., exhibited by L. D. Lansing, a wheelbarrow grass seed sower, adapted to the sowing of clover seed and all kinds of grass seed. It is run by hand in wheelbarrow style, and sows a land fourteen feet wide. It weighs only forty-five pounds. It gives promise of doing good work, and doing it speedily.

Beedle & Kelly, Troy, O., showed a two-horse double row corn drill, regulating the feed to the desired distance between stalks.

Also, a spring-tooth harrow in two triangle-shaped sections, and may be used as a cultivator, or as a pulverizer following a roller.

Waite Manufacturing Company, Grand Haven, Mich., exhibited a rotary drop corn-planter. The drop-plates rotate by an endless chain, and are operated by a hand lever. It can be adjusted to drop any desired number of grains in each hill. It is known as "The Challenge Corn Planter."

James Mossman, Westerville, O., had on exhibition "The Razor-Blade Harrow," which consists of steel blades, somewhat razor-shaped set in two iron bars, and by rotating the bars, adjustable to any desirable angle with the horizon. A good tool in hard clay ground.

Eagle Machine Works, Lancaster, Ohio, had on exhibition a grain drill with an attachment for distributing bone phosphates or guano, by means of a revolving cylinder with spiral grooves, and a clearing wheel to prevent choking from dampness of the material. The arrangement to secure an uniform distribution is a good one. The same company have also a two horse grain drill in two sections, detachable, so that one or both may be used at will.

Also, a one-horse drill of three hoes, intended for seeding in corn rows.

Norris & Bros., Rushville, Ind., exhibited the "star" wheat drill for corn rows or fallow. Has an adjustment for regulating the width of drills and depth of planting. A handy one horse tool.

J. A. Campbell, Harrison, Ohio, showed a corn drill that drops a fertilizer in the drill with the corn. It is a one horse, single row drill, and does a work greatly needed in corn culture.

Kimberlin & Co., Indianapolis, exhibited an iron frame double harrow, with 24 steel teeth in each leaf, and may be folded together for transportation. The teeth are adjustable to any desired angle. It is a simple, durable and very efficient pulverizer.

Also, same company exhibited a three-horse equalizer.

Farmer's Manufacturing Co., Richmond, Ind., showed a two-horse corn planter, which drops from a large drop plate placed at an angle of forty-five degrees with the horizon, and covers the grain by flanges at each side which throw aside clods. It is well made and will do its work satisfactorily.

M. S. Hancock, Dublin, Ind., had on exhibition a platform harrow. It consists of a platform of strong plank six and one-half feet square, divided into two sections. Above this are cross bars to which thirty three steel teeth are attached by clamps, and extend below the platform; by moving the cross bars, the teeth are placed at any desirable angle.

S. B. Hart, Peoria, Ill., exhibited the "union" wheat drill, which has the main shaft or axle grooved longitudinally; and passing under the grain box, these grooves drop the grain into the tubes without gearing of any kind. It has a driver's seat behind for riding, from which the driver can see the whole operation of the team and drill.

Also, a single drill with fertilizer attached, distributing by a toothed wheel operated by an endless screw. In both these drills the hoes are governed by steel springs.

Also, a double row corn planter, with the drop plate operated from the rim. Feed changed without changing feed plates.

F. F. Mayfield, Wirt, Ind., exhibited a soil pulverizer, consisting of a series of knives in front, placed at an angle of forty five degrees, and behind these is a succession of clod-crushers, iron covered, which will very effectually dispose of clods even in the most cloddy ground. It is a two-horse implement.

D. C. Morgan, Kinderhook, Ark., showed a combined planter, having three chambers with drill machinery attached to each, adapted to drilling corn, beans and peas, with an attachment for planting cotton seed. A good implement, well designed and substantially constructed, but a little north of its proper latitude.

E. Over, Indianapolis, exhibited a grain drill adapted to seeding in corn rows, to be operated by one horse. A light and handy implement.

Also, a double A harrow, hinged, and capable of being operated singly, or together.

George W. Brown, Galesburg, Ill., showed the Excelsior double row corn planter drops by hand lever, and has spiral steel springs to force the runners into the ground when it is hard.

CLASS II.—HARVESTING MACHINERY.

Shawnce Agricultural Works, Lena, O., exhibited a spring tooth horse rake. Teeth very elastic. Dump operated by the foot.

Jefferson Caylor, Indianapolis, Ind., showed the Tiger, self-dumping horse rake. Dumps by the power of the team at the will of the driver. A simple and very efficient arrangement.

Tyner & Hadley, Indianapolis, in a large display of implements from their agricultural ware rooms, exhibited the Manny Combined Reaper and Mower. The shield or upper part of the guard is divided so as to prevent choking, and this permits the sickle stroke to be reduced one-third, thus reducing the length of crank, and consequently the power expended in the same ratio. Though cutting four and a half feet, it may be operated as a mower with one horse.

Also, the Excelsior twine binding reaper, from the shops of Hoover & Co., Miamisburg, Ohio. The iron cutter bar and revolving apron operate nearly in contact, so that there can be no loss of straggling grain. The binding is done uniformly and securely.

D. M. Osborn, Cleveland, Ohio, displayed a large and very complete collection of harvesting machinery, among which we note: Osborn's self-binding harvester, adjustable to binding with either wire or twine, as may be preferred. Osborn's self-raking reaper and mower combined, and a combined mower, reaper and dropper. A single front cut mower, and a rear cut mower. In all these implements the machinery is simple and substantial, and the work well executed.

Walter A. Wood, Chicago, Ill., exhibited the Wood mower. It is so arranged the weight falls chiefly on the driving wheel, which prevents any slipping in heavy grass. The cutter bar is covered with a steel plate which prevents the sickle from gumming.

Also, Wood's twine-binding harvester, the points of merit in which are too well known among western farmers to need mention here.

Also, a self-raking reaper, combining the reel and rake in one movement.

Aultman, Miller & Co., Akron, O., displayed a complete series of harvesters, consisting of a wire-binding harvester, cutting six feet swath; and a twine-binder of the same pattern in the cutting and carrying machinery.

Also, a self-raking reaper, cutting five feet, and an iron frame mower of four feet four inches cut. All the machinery is of the first quality.

Indiana Exchange Co., Indianapolis, exhibited the Iron King mower, manufactured by the St. Paul Harvester Co., St. Paul Minnesota. It has an iron frame exclusively, and operates directly in the rear of the team; one horse walking on the uncut grass, and by this means avoiding side draft. The sickle runs on friction rollers and has a long stroke, thus avoiding the rapid motion and reversal so hard on machinery. The driver operates a lever by which he can raise either end of the sickle at will.

Fremont Harvester Co., Fremont Ohio., showed a combined reaper and mower, which claims to dispense with side draft by the method of transmitting motion from the driving wheel. It has a jointed pitman, which enables it to cut on uneven ground without strain. It has an automatic rake and reel combined.

Also, the same Company have a mower designed for one horse. It cuts a swath 4 feet wide. Its machinery is strong though light; and in light grass a heavy horse will do good work.

Also, a single wheel, light draft mower with many good points.

Peter Mill, Minneapolis, Minn., exhibited the Minneapolis Harvester, a twine binder, cutting 6 feet 8 inches. It raises, lowers, or regulates the sickle while the machine is in motion, without interfering with its work.

George Easterly & Son, Whitewater, Wis., showed a twine-binding harvester, cutting 6½ feet wide. It has a wrought iron cutterbar, and the revolving apron is supported by iron straining rods which maintains its uniform tension. It has side aprons at the point where the grain is elevated for the purpose of straightening tangled grain. The sickle and apron can be raised or lowered while the machine is in motion.

Allen, Johnson & Cochran, Indianapolis, Ind., exhibited a light draft mower cutting 4½ feet wide. This mower introduces a number of novel devices, many of which are of unquestionable merit, but which can not be well described without drawings.

The Dorsey Machine Co., Milton, Ind., had on exhibition a twine-binding harvester, which adjusts its sickle and platform without stopping the machine. It has a reel that can be adjusted to accommodate any condition of grain while in motion.

Also, the same company exhibited a combined reaper and mower, and a single mower, both of good material and excellent workmanship.

A. H. Meal, Indianapolis, showed a group of harvest machinery manufactured by Siberling & Co., Akron, Ohio, among which is the Empire twine binder, a light and strong self-binding reaper.

The driving wheel is made of wood with iron gearing attached. This, it is claimed, gives greater steadiness to the motion. from its elasticity.

The Empire table-rake reaper, a very ingenious device, yet simple and efficient. In all the Empire harvest machinery the gearing is enclosed so as to secure it from dust.

The Peerless Reaper Co., Canton, Ohio, exhibited the Peerless self-raking reaper. This implement has a pitman, with a ball and socket joint, which allows the sickle to be placed in any attitude without strain on the machinery. This peculiarity is maintained in all the machines exhibited by this company, which consists of a combined reaper and mower, a single mower, one wheel rice reaper, and one wheel dropping reaper. All have chain gearing.

Indiana Exchange, Indianapolis, exhibited a horse hay-rake with steel teeth. Dumps its load by a hand lever.

W. K. Sproule, Indianapolis, showed the Hamilton sulky rake, manufactured by Long & Allstatter, Hamilton, Ohio. It has twenty-two teeth made of tapering steel rods, so arranged as to avoid lateral motions. Dumps by hand lever.

J. & F. Nei, Columbia City, Ind., exhibited a hay carrier for storing hay in a mow. It runs on an iron track.

J. E. Porter, Ottowa, Ill., showed Porter's hay carrier. The load travels on a wooden track suspended by iron rods. It has a double set of friction rollers, and an automatic lock which holds the load at any desired point.

Beedle & Kelly, Troy O., exhibited a sulky hay rake, steel teeth and hand dump, good material and well made.

Bowers Hay Tool Company, Crawfordsville, Ind., had on exhibition three hay carriers, to-wit:

1. Reversible carrier; the load travels on a suspended beam by double rollers in either direction.
2. The hoosier carrier, which slides on its track.
3. The union, which runs on wheels and is supported without strain on the rope.

Wm. Deering, Chicago, Ill., had on exhibition a twine binding harvester, cutting six and one-half feet wide. A single lever and chain by its several movements, adjusts the reel to suit any condition of grain.

Also, a single mower. The sickle base has a width of two and one-quarter inch with a stroke of three inches, which insures it against choking in tangled grass.

The McCormick Harvesting Machine Company, Chicago, Ill., presented for public inspection the original self-binding reaper with the latest improvements of the inventor. Binds with twine and compresses the sheaf with iron arms before binding so that the tension is taken off from the cord in the act of binding. It is a light draft, two-horse implement and is completely adjustable from the driver's seat without stopping the machine.

Also, a light draft, adjustable raking reaper and a drop harvester.

Also, an iron mower, light draft for two horses. The iron and steel used in the McCormick harvesting machinery is specially selected by an expert, and is of the best quality. Clean cutting is claimed as a specialty in these implements.

CHAMPION HARVEST MACHINERY.

Whitney, Fassler & Kelly, Springfield, O., presented this complete group for inspection:

1. The champion twine-binding reaper. It has an angular sickle bar of polished steel, and wrought iron guards, case-hardened. The tension of the apron is maintained by steel springs beneath it, and the elevator has a canvass back. An iron lever and spring relieves the tension from the needle and three packers compress the sheaf for binding, while a shield protects the needle arms.
2. New champion mower, dispenses with the crank, the sickle receiving its motion from an oscilating plate on the driving wheel. A new and very ingenious device.
3. A light mower, designed to be operated by one horse. A very convenient implement for small farmers.
4. A light center-cut single reaper.
5. A heavy iron-frame reaper with automatic rakes. Cuts six feet wide.
6. A combined raking reaper and mower.
7. A combined dropping reaper and mower. Throughout, the champion harvest machinery presents a model of fine workmanship.

F. M. Ferguson, Greenell, Iowa, exhibited a heading harvester, designed to be operated by four or six horses, and cuts a swath fourteen feet wide, merely removing the heads of the wheat and leaving the straw on the ground. The use of this implement is, comparatively, an untried experiment here. In the region of rainless summers on the Pacific coast, the header is an admirable machine, transferring the standing wheat, fully dry, directly to the thresher; but in this moist climate, where wheat requires a seasoning in the shock to fit it it for the thresher, the use of the header is, at best, an unsolved problem.

CLASS III.—TOOLS FOR STOCK-FEEDING.

W. K. Sproule, Indianapolis, exhibited two feed cutters, from the shop of Long & Allstatter, Hamilton, Ohio. They are substantialty of the same pattern, but of different sizes. Have revolving knives and a safety fly wheel.

Eagle Machine Co., Lancaster, Ohio, exhibited a group of five straw-cutters, ranging in size from a large power machine down to a small hand straw-cutter. They are constructed with revolving knives, and are adjustable to any desired length of cut, from ¼ of an inch to 1¼ inches. They are self-feeding.

Tyner & Hadley, Indianapolis, exhibited the Challenge feed mill, made by the Challenge Mill Company, Batavia, Ill. It is a 4-horse power mill, grinds by chilled iron disks, shells and grinds forty bushels of corn per hour. This is the largest of nine sizes of this mill.

Also, five sizes of the Big Giant corn and cob crushing feed mill. It has an inner cone stationary, and an outer heavy chilled iron case, which is moved. It grinds of any required fineness.

Also, the Lion feed cutter, made by Belcher & Taylor, Chicopee Falls, Mass. It has two revolving knives and a safety fly wheel. Also, the Baldwin feed cutter, with a single revolving knife. It is simple and a very rapid straw cutter.

CLASS IV.—UNCLASSIFIED DEVICES.

P. P. Mast, Springfield, Ohio, exhibited a hand cider mill and press of the common pattern.

Wm. Detrick, Indianapolis, showed a hand corn sheller, operating on an entirely new principle; small and simple; occupies but little room; is turned with one hand easily; shells a bushel of corn in five minutes, and costs $5.

Tyner & Hadley, Indianapolis, exhibited Pennock's road grader, adapted to horse power. 2, 4 or 6 horses may be used in operating it. It grades and smoothes a road bed, with a rate of speed proportioned to the power used.

William K. Sproule, Indianapolis, exhibited three swinging churns, Nos. 2, 3 and 4. The churn has no internal machinery for agitating the cream, that being effected by reversing the motion in swinging.

Also, three bentwood churns, with revolving dashers.

George W. Brown, Galesburg, Ill., had on exhibition a corn-stalk cutter, with six knives on a traveling cylinder; cuts the stalk into sections eleven inches long, so that they can be readily turned under by a breaking plow.

Kemp & Burpee, Syracuse, N. Y., exhibited the patent manure spreader, of which they are the manufacturers. This is a manure cart of the capacity of thirty bushels of long barn-yard or stable manure, which it distributes from the rear end, uniformly, over a land five feet wide, by machinery put in motion by the forward movement of the cart. It may be set to distribute any quantity, from five to twenty loads per acre. This implement supplies a long felt want on the farm.

Fletcher & Thomas, Indianapolis, had in operation on the ground "The Quaker Brick Machine." It tempers the clay and fills the moulds by power impelled machinery. They are borne off by hand and placed on a rack to dry under shelter, so that cracking on the yard and loss from rain is avoided. The machine makes very smooth bricks, at the rate of 20,000 per day. It is certainly a great improvement on the Egyptian method of "bricks without straw."

Eagle Machine Co., Lancaster, Ohio, exhibited a hand and power corn sheller, combined. It has a fan attached which is used with power, to clean the grain.

Also, a single hand sheller for barn use.

Samuel Males, Cincinnati, Ohio, showed a hand cider or grape mill and press of the common style.

Also, a drag saw operated by hands and feet—a very economical way of applying human force to do hard work—indeed, a new departure in the division of labor.

Theodore Kreseen, Young America, Cass County, Ind., showed an improvement in carriages by which the seat and hind gate, or end, are attached together and open on hinges, so as to permit persons to enter by the rear, and thus avoid the wheels, which is no small advantage when the roads are muddy.

J. L. Manlove, Milton, Ind., displayed in operation an automatic gate, opening ing and closing by the approaching and retiring carriage wheels. The operating rods are enclosed in iron gas pipe, thus avoiding the hindrance of ice in the winter. The center is changed by moving the lower hinge in a slot.

Also, the same party has a combination iron and wooden fence, both ornamental and substantial.

A. C. Case, for the Western Gate Co., Muncie, Ind., exhibited the western automatic gate. It opens and closes by the passing wheels. The motion is effected by rotating the upper hinge. It has a device for overcoming the effect of expansion and contraction in the operating rods. When closed the weight of the gate is supported chiefly on the latch.

Harry L. Cannutt, Dublin, Indiana, operated a self-opening gate. The back upright post sits on a bar that is moved by the rods, so as to change the center of gravity. The upper hinge operates in front instead of behind the post. It has a rubber rest at the latch.

T. E. Wasson, Kokomo, Ind., showed a farm gate of a simple, yet ingenious construction. It is so arranged that it can be opened entire for the passage of wagons, or so as to admit a horse to pass; or it may be opened below for hogs only. It is cheap and convenient.

The Indianapolis Excelsior Co., Indianapolis, exhibited a bale of Excelsior, a material made from linn wood and used in upholstery and in packing goods.

Also, a cord of the wood used in its manufacture. A new industry.

North Indianapolis Wagon Works, North Indianapolis, by James Frank, agent, exhibited eight farm wagons, of good material and workmanship, and well adapted to farm use.

A. Cassel, Indianapolis, Ind., exhibited and operated a straw carrier for stacking straw or hay. It is operated by one horse, and will carry straw to the top of a stack twenty-five feet high.

E. J. Howland, Indianapolis, showed a road scraper and grader, which, in operation, is attached to the king bolt of a two horse wagon.

E. Over, Indianapolis, exhibited a stump extractor, which appears to be an engine of great power and easily operated.

Also, a farm wagon and a cider mill and press.

J. M. Cooper, Lathrop, Missouri, operated a trough-filler, or stock pump, by which the weight of the animal on the platform fills the trough with water.

Barnard & Leas, Moline, Illinois, had on exhibition a power corn sheller intended for use in elevators and warehouses. A very complete piece of machinery, and well adopted to the purpose designed.

Tyner & Hadley, Indianapolis, exhibited the veteran corn sheller, made by The Sandwich Manufacturing Company, Sandwich, Illinois. It is a hand, or power machine as the operator chooses, shells rapidly and has a fan attachment for cleaning the grain from chaff and dust. It is especially adapted to custom mills.

GENERAL REMARKS.

The display of Farm Machinery increases with each successive Fair; nor is it merely in the number and variety of implements that we mark an advance, though in this direction there is much that is worthy of note. We are gradually dispensing with hand labor in almost every department of farm work. The sulky plow has dispensed with the "plowman"—so long celebrated in story and in song. We have now merely a driver, and he riding in a comfortable seat at that. The reaper and his sheaves, belong to the past; and so does the thresher with his flail. Corn gathering is nearly the only department of farm work that has not been invaded by machinery. In this we have made little or no improvement on the methods of our grandfathers, unless it be when we employ hogs to do the work for us. The present Fair, while it shows a great improvement on existing implements, presents no advance into new fields, except in the introduction of the Patent Manure Spreader, by Kemp & Burpes, Syracuse New York. We have had many machines for distributing commercial fertilizers, but barnyard and stable manures, have heretofore been spread by hand, and to do it well has always been a difficult task. This implement does its work well, and supplies a want that has been long felt on the farm. In plows, the tendency is towards heavier machinery, and in the direction of substituting iron, or steel, for wood. This looks towards deeper and more thorough cultivation. In harvesting machinery this order is reversed. The tendency is now towards lighter reapers and mowers. Most of the self-binders exhibited this year are intended to be operated by two horses, and several one-horse mowers were on exhibition. In binders there is an evident tendency towards the exclusive use of twine, as the binding material. In the manufacture of farm tools and machinery, there is a tendency to replace wood with iron, thus adding to the strength and durability of the implement without materially increasing the weight. This year manifests a growing disposition to use steel, especially in the construction of plows, cultivators and harrows. The greater strength and elasticity of steel gives it a preference to iron, or any other material for many purposes; and it is now but little more expensive than iron. It is an advantage of no small importance in our farm machinery as now made, that if a part breaks, a duplicate of the same number can be obtained from the manufacturer, by express, in a few days and the implement restored again. It would be hazardous to fix a limit to the ever-advancing improvement of farm tools and machinery. Perhaps this can be limited only by the intelligence of those who use them.

R. T. Brown,
S. J. Tomlinson,
Committee.

REPORT

OF THE

COMMITTEE ON SPECIAL MERITS, BOOK "G."

The undersigned committee, appointed to examine carriages and furniture, carpets, rugs, oil cloths, etc., paper hangings, curtains, house decorations, etc., etc., entered in Book G, respectfully report that they have carefully examined the various articles on exhibition, and have noted the points of merit as fully as the time would allow. Owing to the fact that we could not find the owners of many articles on exhibition your committee failed to get all the information desired. The display of carriages and buggies, furniture, toys and notions, carpets and paper hangings, etc., were very fine.

Albert Gall, Indianapolis, exhibited a fine display of rugs, carpets, wall paper, decorations, laces, draperies, oil cloths and lambrequins, which attracted the attention of the visitors.

Sander & Recker, 103 *and* 105 *East Washington street, Indianapolis.*—This firm made a splendid display of fine furniture and upholstered work. One very fine chamber suit of rare beauty, ebony chairs and mirrors, sofas, book-cases, etc., very elegant.

Seymour Spring Bed Manufacturing Company, Seymour, Ind., exhibited one of Bowen's spring bed bottoms, constructed of wood and steel springs, the wood springs being of strips two inches wide and one-quarter of an inch thick, extending lengthwise, supported by steel springs immediately under the wooden springs. A new and nice invention.

G. W. Taylor, Indianapolis, exhibited a McLane rocking chair and crib, admirably and simply constructed. Very desirable.

F. M. Dillie & Co., Cincinnati, O., exhibited an adjustable easy chair, substantially and simply constructed, easily adjusted. A very nice piece of work.

J. W. Perkins, Cincinnati, O., favorite bed spring, Wildermuth patent. Spring made of Bessemer steel, and connected at bottom. Adjustable to any bedstead.

— *Kraus, Indianpolis,* exhibited a patent sofa, bed and parlor lounge. A splendid assortment.

J. Yagerliner, Nine Mile, Ind., exhibited Wildermuth improved, patent, combination, duplex, spring bed, made of Bessemer steel with top connections and adjustible to any bed.

J. C. Chample, Indianapolis, exhibited a patent chair. So constructed as to be used as a chair or lounge; also, writing desk. Very nice arrangement.

Israel Hoagland, Indianapolis, exhibited a specimen one-stave bucket, which seemed to be a good improvement.

George Gesler, Indianapolis, exhibited boots and shoes. A very good display.

A. J. Johnson & Co., Rochester, N. Y., exhibited a good display of shoes of their own manufactnre.

Charles Mayer & Co., Indianapolis, exhibited a large and splendid assortment of notions and toys.

H. S. Tucker, Indianapolis, exhibited kid gloves. Small but select display.

CARRIAGES, BUGGIES, ETC.

Shaw, Backus & Co., Indianapolis, Manufacturers of Carriages, Buggies, Phaetons, Spring and Farm Wagons, exhibited a large and fine display of goods in their line, among the display were several double-truss spring wagons, for general purposes; one fine covered double platform delivery wagon; a large number of buggies and phaetons, all of excellent workmanship and fine finish.

Also, one farm wagon made on the new circle tracking principle.

Robbins & Garrard, Indianapolis, Manufacturers of Carriages, Buggies, Phaetons, Barouches, etc. This firm made a fine display in their line, one very fine Hearse, silver mounted and gold trimmings; one canopy top Saxon carriage; one four passenger Kellogg, and four passenger extension top barouche; one shifting curtain Rockaway, besides a large number of phaetons and open and top buggies, all of superior workmanship and finish.

F. Bremmerman & Co., Indianapolis, exhibited a line of their goods among which were two barouches, one adjusting seat carriage and a number of buggies. Very good.

H. Black, 44 *East Maryland Street, Indianapolis,* exhibited one Jager wagon or family carriage adjustable seat, one barouche, also side-bars and hand spring buggies, all of good workmanship and finish.

A. J. Johr, Indianapolis, exhibited three side-bar buggies, substantially made and well finished.

Also buggy tops, hand made and wrought iron, works very nice and durable.

Bernd Bros. & Co., Indianapolis, exhibited some very good 2 and 3 spring and platform wagons.

C. Fockler & Bro., Dubuque, Iowa, exhibited a good assortment of Key City joint brace carriage and buggy tops.

Theo. Kriessen, Young America, Ind., exhibited one patent spring wagon so arranged with swinging gate and seat in rear so as to open and admit and seat occupants without climbing over side or front. A very nice arrangement.

D. Kregelo & Son, Indianapolis, exhibited a fine display of covered caskets, one of which was similar to the one President Garfield was buried in.

Also a fine line of robes and trimmings.

S. L. Warner, Indianapolis, exhibited a very large display of cloth covered metalic and marble caskets.

Also a fine line of robes and linings.

In submitting the foregoing report the Committee found many articles that were not placed upon the book, some of which we have reported on and others we could not get the proper information. All of which is respectfully submitted.

W. A. Sturgeon,
David Hazzard,
Committee.

REPORT

OF THE

COMMITTEE ON ARTICLES CONTAINED IN BOOK "H."

The undersigned committee, appointed to examine articles in book "H," consisting of paintings in oil; water colors; mechanical, architectural, crayon and pencil drawing; engraving on steel, precious metals and woods; wood carving and general lithography, respectfully report that they have carefully examined the various articles on exhibition, and have noted the points of merit in each, so far as the time alloted to such examination would allow. It would have greatly facilitated the labors of the committee, and have given greater satisfaction, if the owners of property had been present to have given the committee information as to the articles.

John Edenharter, Indianapolis, exhibited three fancy jewelry boxes of his make They are rare specimens of various styles of veneering, made by hand. The veneering is carefully and artfully laid and polished. They are much more fancy than useful.

F. L. Horton, Indianapolis, exhibited a book bearing the title, "The American Farm and Home." A cyclopædia published by F. L. Horton & Co., of Indianapolis, in 1881. It is a book of 1,000 pages, and is, as its name implies, a cyclopædia of matters connected with the farm and farm life. The author is Horace R. Allen.

F. L. Horton, also exhibited lithographs of President and Mrs. Garfield, and steel portrates of the same. A map of Palestine and chronological journeys of Jesus, by Rev. A. P. Stoute, is an excellent aid to the study of the gospels. The map as a work of art is very creditable.

C. C. Koerner of the Business College, Indianapolis, exhibited specimens of card writing, pen portrait, pen drawing, stipple work, off-hand flourishing, ornamental penmanship, business writing and display of penmanship from his business college. While these specimens are very excellent to please the eye, they would hardly answer for the practical and stern duties of life.

R. E. Hanison, Indianapolis, exhibited three pencil portraits. The portrait of a child is well executed.

C. J. Fiscus, Indianapolis, exhibited a collection of oil paintings, consisting of portraits and landscapes.

C. F. Anderson, Indianapolis, exhibited three portraits in crayon—one a child full size, and one a lady, well executed. The lights and shades were well blended.

Th. Stevenson, Indianapolis, exhibited a large collection of drawings and sketches from nature, and portraits in ink, crayon, pencil and oil. One of President Garfield in crayon is especially worthy of commendation. Two heads of children in the same drawing, in water colors, attracted much attention.

Alice Lucas, Spencer, O., exhibited one oil painting of Rip Van Winkle, well and tastefully done, as a work of imagination. But whoever saw the personage.

Cora Mick, Indianapolis, exhibited a good specimen of pen drawing.

Anna M. Mick, Indianapolis, exhibited one piece of penmanship.

Mrs. A. M. Woodward, Indianapolis, exhibited four pieces of oil painting of landscapes.

John W. Blake, Indianapolis, exhibited an oil painting of Col. Blake, which vividly reminded his old acquaintances of his former self, and of the kindly heart he always had for the poor.

Purdue University exhibit was in charge of W. P. Gross, Instructor in the Department of Practical Mechanics. The exhibit consists of specimens of work done by students in each of the following branches:

First—Bench work in wood.
Second—Wood turning.
Third—Pattern making, moulding and casting.
Fourth—Vise work in iron.
Fifth—Forging; and
Sixth—Machine work.

The entire exhibit represents the efforts of the students from the beginning to the end of his course in the shops, from the simplest to the most difficult mechanical apparatus. Thus, in wood work may be seen the first results of his labor in the form of a simple yet well made box, followed by splices of different kinds, mortise and dove-tail joints, and finally panel and truss work. In wood turning, first simple pieces bringing into play the different uses of the cutting tools, and then a series of small ornamental articles, such as a card stand, picture frames, match safes, card receivers and turned balls. The turnings are very noticeable on account of the beautiful finish and polish given them. They present a nice appearance.

The exhibition of patterns include a full set for a three-horse power steam engine, together with elbow, off-set and return joints, with core boxes, for 2½-inch pipe; also wheel and pulley patterns, etc. The vise work in iron includes examples of chipping, filing and scraping. Among the appreciable features of this branch of work are three surface plates eight inches square, well finished and fitted with brass handles. The top of each plate is brought to such a perfectly true plane surface that when one is placed upon either of the others it does not immediately come in contact on account of the air between them not being expelled. It then seems to float upon the lower, and can be moved by the lightest pressure of the finger. When the two are brought in contact, however, by pressing and rubbing them together, they seem as one plate, and can not be pulled apart. They may be separated by slipping one from the other.

The forgings are very much varied in their nature and include examples of drawing, upsetting, bending and welding. Open and welded rings, drawn and welded corners, tongs, punches, drills, chisels, springs, etc., form the attractive feature. The machine work includes straight and taper turning, straight and angle planing, a steam engine cylinder and girders. Upon the whole, the exhibition is excellent.

The display of drawings made by the Indianapolis Public Schools was worthy of notice. The system is presented in the American text books of art education, and aims primarily at teaching two things. First, *how to see* and *how to draw;* second, *how to arrange* the proper subjects for the application of *practice* in drawing. It gives a knowledge of all geometrical forms and how to construct them, with the application of those forms in ornament and in the representation of common objects, at the same time that it develops manual skill in drawing. It also gives carefully graded instruction in various branches of the study which require the *application*, first, of *knowledge* of form, and second, of skill in drawing. Thus, besides a knowledge of *geometry*, as a basis of all forms, it provides for object drawing, by presenting the principles to be observed, in expressing both the facts and the appearances of natural and manufactured objects in their outline, in light and shade and in color. It provides instruction in practical design, by developing the taste and the creative powers of pupils in industrial design, in connection with the study in geometry of natural forms, and of historical ornament. It gives instruction in mechanical drawing, teaching the elementary principles of machine drawing, architectural drawing and drafting for civil engineering. It includes a harmonious grading of all these branches of the subject, with reference to the development of good taste, artistic skill and expression, and an appreciation of the beautiful, both in nature and in art.

A. M. Nichol, from Granville, Ohio, exhibited Willard's Indelible Oil Crayons. These crayons are for marking on wood, cloth, paper, tin, iron, crockery, glass, or any other substance having a surface capable of receiving impression, and is claimed to be absolutely indelible. These crayons, of different colors, may well take the place of the old fashioned marking pots of manufacturers, jobbers, retail merchants, and shippers.

Respectfully submitted,

George L. Curtiss,
Lucius A. Stockwell,
W. J. Carleton.
Committee.

PLEASANT TERMINATION OF THE FAIR OF 1881.

The exhibitors of farm machinery, in appreciation of the efficiency of President Lockhart, presented him with a silver water service and gold headed cane. Hon. Stanton J. Peele making the presentation as follows:

MR. LOCKHART, upon my return to the city a few minutes ago, I was requested by your numerous friends now surrounding you in this parlor, to express to you in a substantial way their kind appreciation of your course and management as president of the State Board of Agriculture.

Sir, it must be a pleasure to you to know that your course meets the approbation so generally of the exhibitors at the State Fair just closed; to be able to meet the approval of those who represent, as they do, the farming and industrial interests of our State, is indeed a sufficient compensation; but they have thought it not inappropriate at this time to manifest their regard and high esteem by testifying in this way their appreciation of your impartiality and uniform courtesy. And now sir, on behalf of these gentlemen, it gives me pleasure to present to you this silver water service; accept it for yourself; accept it for your good wife, and in the name of these exhibitors may you live many years to enjoy the memories of this occasion, and to drink from the pitcher as one drawing new life.

And now sir, if you have never been caned, prepare, for while these same gentlemen have thus testified their high regard for you, for what you have done for them and our State, expressing as they have the hope that you might live many years, they have also concluded to aid you in that long life by adding another prop, which they hope may be useful in your more declining years.

Therefore, accept this beautiful cane, and as you journey through life, may it afford you that aid and comfort which the recollections of this occasion might fail to do. Wear it as an emblem of duty well done; wear it as a token of regard for your uniform courtesy; wear it as a slight testimonial from these gentlemen, whose position has been such as to appreciate your services as an officer, and your bearing and courtesy as a gentleman.

RESPONSE BY MR. LOCKHART.

GENTLEMEN—I find myself at a loss for words to express my feelings on this occasion.

If a committee of the exhibitors in your department had called on me to ask for better facilites to enable you to make a display of your machinery, I think I should have been able to have given you an answer; but, coming as you have, *en masse*, to present to me this beautiful silver water service, and this massive gold headed cane, as a token of your appreciation of my services as President of the State Board of Agriculture, has taken me by surprise, and language fails me to express myself as I would wish to do. To say that I thank you for this expression of your feelings towards me at the close of one of the most successful State Fairs ever held in the State, would but feebly express my feelings on this occasion.

I see before me the representatives of the largest manufactories of farm implements in the world. To you has been entrusted the work of placing before the American farmers all the improvements in farm machinery that have been made in the last quarter of a century. The State Board of Agriculture realizing the great importance of your work in perfecting machinery for the farmers' use, have felt it to be their duty to give to you every opportunity that was in their power to make a display at our State Fairs, that would be not only a credit to yourselves, but, also, to the State Board.

In accepting these beautiful presents at your hands, please understand, that not to myself alone is this honor due; but to each member of the Board, honor is due, for the manner in which I have been enabled to provide for your wants as exhibitors, and I think I can assure you that you will always receive a hearty welcome as exhibitors at the Indiana State Fairs.

Again I thank you for the great honor you have conferred in the presentation of these beautiful gifts as an evidence of your appreciation of my services, and I can assure you that they are more valuable to me than their weight in gold and silver. They shall be ever kept as kind remembrances of valued friends.

ESSAYS.

TOPOGRAPHY OF INDIANA.*

BY PROF. JOHN L. CAMPBELL, OF WABASH COLLEGE.

The history of Indiana dates back to the shadowy era of the Mound Builders. But the earth-work monuments of this earlier race have revealed but little of their history; whence they came, whither they went, are yet unknown. The language of the hillocks still is to be translated. Our ancient history is not yet written.

Our modern history begins with the record of the severe and prolonged conflicts between the Indian owners of this beautiful land and the white invaders who were commissioned in the name of civilization to dispossess the original possessors.

A passing tribute of praise is here offered to the few early settlers of Indiana who yet survive, but who soon must obey the inexorable summons to join the majority in the silent land.

Our pioneers had the courage to cope with the Miamis, Pottawatomies, Piankashaws, Weas and Wyandottes, who claimed this territory as their own, and the greater courage possibly to carve out homes in the wooded wilderness whose rich acres were cumbered by a growth so dense that the woodman's axe seemed like a toy. "Life in the clearings" was true and noble stalwartism—our fathers were heroes.

The wonderful increase in population, material wealth, and general prosperity of the State as shown by the comparative tables of statistics, makes any inquiry into the causes which have been, and still are producing such happy effects, of special interest.

The geographical situation of the State gives it superior advantages. It lies between the thirty-seventh and forty-third parallels of north latitude, which makes the climate especially adapted to the culture of corn, wheat and other grains, and the production of horses, cattle, sheep and other domestic animals. The hill country on the south, and the lake region on the north, compel the larger part of the railway travel and traffic to pass through the State. It was once called a Western State, now it is the center of population for the United States.

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* Delivered before the Annual Agricultural Convention, January, 1882.

The subject proposed for consideration in this paper is the general topography of the State with special reference to the further development of our resources by the reclamation of our yet undrained swamp lands.

The historian of current life and events deals with time as measured by the short period of years and centuries—the geologist requires the larger units of thousands and millions of years for the evolution of rocks and strata and soils.

Between the proper field of the geologist and the historian lies the general subject of topography. After the mighty convulsion which gave birth to mountains, and the intense productive energy which formed coal beds were ended—when sea bottoms with their marine fossils were no longer interchanging places with mountain tops—when even the glacier had silently disappeared under the mild persuasion of the sun—the further task of modifying the surface of the earth was committed to the drop of water.

The drop of water is a very little thing—easily brushed aside and readily forgotten—and yet in it are pent up forces capable of changing a world. To produce the drops of water, which come to the earth in the form of rain, the machinery of the ocean of water which forms three-fourths of the surface of the earth is needed—likewise the ocean of air, fifty miles deep, and on whose bottom we are the creepers;—and the all pervading presence of heat.

With this machinery we have only to apply the heat to the water and the ocean will rise invisible into the air—withdraw the heat and the invisible will become visible again in clouds and then descend in drops of rain. Thus was formed thousands, it may be millions of years ago, the little thing, to which was given the task of fashioning the earth.

Ceaselessly through the ages has it done and is yet doing its work. Tremblingly from its home in the sky the rain-drop descends to earth—every plant welcomes its coming and every creature breathes for it a blessing. The clustered unions come dripping from the eaves and go murmuring in joy along the rills—cutting tiny channels which deepen and widen to great valleys.

Rivulets become rivers and the multiplied drops flow on till they are lost in the ocean. But this death is not an eternal sleep—for the drop rises again in vapor invisible in the sky, to repeat in never ending circuit the labor committed to it from the beginning.

At the close of the glacial epoch, within the three hundred by one hundred and fifty miles, which now is the State of Indiana, the surface was a vast plain elevated a little more than one thousand feet above the level of the sea. This plain was nearly level, with a possible elevation of twelve or thirteen hundred feet on the extreme eastern part, and sloping gradually to the south-west to an elevation of nine hundred feet.

As a result of glacial action, and particularly from the melting of the glaciers, there were great grooves or channels through which the melting ice was carried to the ocean.

These glacier channels gave the initial directions to our main water courses, and from these the chief features of our present surface topography are derived.

The central topographic feature of the State is the Wabash river. It takes its rise in Ohio over the eastern line of the State—flows entirely across the State, dividing it into two parts—receives the principal streams from three-fourths of the State, and forms nearly one-half the boundary between Indiana and Illinois.

To pass through the State in any part north or south, one must cross the Wabash river.

The current of the river is a comparatively rapid one, as will be seen by the following table of elevations reduced to sea levels for different points along the stream:

Adams county	820
Mouth Salamonie river	667
Mouth Eel river	583
Mouth Tippecanoe river	514
Lafayette	506
Terre Haute	451
Vincennes	414
Ohio river at mouth of Wabash	313

The following cross sections give a general view of the depth of the river below the surface of the table lands through which it runs. On the line of the Indianapolis, Peru & Chicago division of the Wabash railway:

Table land near Bunker Hill	820
Peru reservoir	740
Wabash at Peru	650
Summit, between Wabash and Eel rivers	780
Eel river crossing I., P. & C. R. R.	685
Table lands near Deedsville	840

On the line of the Michigan road:

Boyleston.	910
Sharon	770
Wheeling	750
Cass county line	720
Wabash at Logansport	583
Metea	780

On the line of the Louisville, New Albany & Chicago railway:

Linden	790
Corwin	739
Taylors	644
Wabash at Lafayette	506
Battle Ground	586
Brookston	685
Chalmers	710

On the line of Terre Haute & Indianapolis railroad:

Brazil	649
Depot at Terre Haute	498
Wabash at Terre Haute	451

The general statement is more than sustained by all the data I have been able to collect, that the channel of the river is one hundred and fifty feet below the level of the summit table lands through which it flows.

Next to the Wabash, White river is the most prominent topographic feature of the State. The source of the river is in Randolph county, a few miles from the eastern boundary of the State. It flows quite across the State, and contrary to common belief, it has a more rapid flow than the Wabash.

The surface declivity is shown by the following table of sea levels:

White river at Winchester	1,053
White river at Muncie	946
White river at Anderson	749
White river at Noblesville	730
White river at Indianapolis	691
White river at Gosport	554
White river at Bloomfield	490
White river at junction with East Fork	396

On the line of the Indianapolis, Peru & Chicago railway for cross section we find:

Summit near Castleton	820
White river at Noblesville	730
Tipton	860
Kokomo	840

On the line of the Michigan road:

Crown Hill (cemetery Summit)	840
White river north	705
Marion county line	850

In the vicinity of Indianapolis:

Irvington	840
White river at Indianapolis	691
McCaslin's Hill west	840

The general estimate is made that the surface of White river is over one hundred and twenty-five feet below the summit levels of the country north of Indianapolis through which it flows.

I have not yet obtained any data for cross sections along this stream south of Indianapolis.

The White Water and Blue Rivers are the chief channels through which the part of the State bordering on the Ohio river is drained.

A small portion of the northeastern part of the State sends its waters through the Maumee to Lake Erie; and a larger portion in the north part of the State through the St. Joseph to Lake Michigan.

The Kankakee river is the outlet at present for a large part of the marsh lands in the northwestern section of the State.

This river is unlike the other streams in the State, in that its surface is very little below the summit level of the country through which it passes, and consequently it is nearly useless for lateral drainage.

The river takes its rise in the table-lands near South Bend, and the following table of levels shows the fall.

Source of river	711
P., Ft. W. & C. R. R	667
English Lake	664
L., N. A. & C. R. R	661
State Line	626

The Des Plaines and Kankakee rivers form the Illinois river, and from the table of levels for the Illinois river, it will be seen that it is a more sluggish stream than any of the rivers of Indiana.

Des Plaines at Joliet	543
Illinois river at Ottawa	448
Illinois river at LaSalle	439
Illinois river at Peoria	433
Illinois river at Beardstown	423
Illinois river at Naples	418
Illinois river mouth at Mississippi	410

It will be noticed that there is a fall of only thirty-eight feet from Ottawa to the mouth of the river.

The streams enumerated are the main channels through which the surface water must pass.

From these deep main lines the secondary system of rivers radiate, and from these a tertiary system of creeks and from these the smaller rivulets, like the divisions and sub-divisions of the veins or arteries in the human body.

In volcanic regions the office of the drop of water is to smooth down and round off the rugged surface—to wear away hills and mountains; here, on the contrary, its work is the construction of hills by the process of deepening channels in an original level surface.

As a result of this action we have the rough, hilly country of the southern part of the State, of which the most prominent illustration is the line of knobs which extends from the Ohio river north through Floyd, Clark and Washington Counties to the Muscatatuk river, then reappear as the sand hills of Jackson County, between the Muscatatuk and White rivers, and again on the north side of East White river, in the specially rugged and bold hills of Bartholomew and Brown counties, which diminish northward in Johnson and Morgan counties, and disappear finally in Marion County, a few miles south of Indianapolis.

The Guinea knobs and the Auburn hills stand as sentinels along the east bank of the Collett glacial river from the falls of the Ohio northward.

The knobs present the appearance of elevated hills, rising in many places four or five hundred feet above the adjacent country and terminating frequently in precipitous bluffs.

The tops of the knobs, however, are in no case more than one thousand feet above the sea level, and where they present any extended area the surface is level.

With this view of the formation of the hills of Southern Indiana there is no difficulty in accounting for the isolated deposits of drift and sand which are found on these seeming elevations.

This discussion is limited to the consideration of recent water action, and has no reference to the geological formations which mark the several divisions of the State.

Topographically the State may be divided into the "hill country" and the "table lands;" the hill country being south of an east and west line through Indianapolis, and the table land comprising all of the State north of the same line.

The topographical character of the country is satisfactorily shown by the profiles of the various railway lines which are constructed through the State.

For illustration of the hill country the profiles reduced to sea levels of three of the most prominent railways are presented herewith: The Louisville, New Albany & Chicago, the Jeffersonville, Madison & Indianapolis, and the Cincinnati, Indianapolis, St. Louis & Chicago.

LOUISVILLE, NEW ALBANY & CHICAGO RAILWAY.

Low water, Ohio, at New Albany	365
L., N. A & C. R. R. Depot at New Albany	436
Bennettsville	541
New Providence	555
Top Knobs	717
26 Mile post	835
Harristown	869
Salem	716
Smedley	878
Mitchell	666
East White River Bridge	503
Bedford	681
72 Mile post	708
Salt Creek	505
Bloomington	744
99 Mile post	882
Ellettsville	685
West White River Bridge	570
Quincy	757
Cloverdale	785
Greencastle, (I. & St. L. crossing)	769
Walnut Creek	710
Bainbridge	935
149 Mile post, (highest point on line of road)	955
Roachdale	851

Whitesville	877
Crawfordsville Junction	786
Linden	790
Taylors	644
Lafayette, (C., I. St. L. & C. and Wabash St. L. & P. crossing)	574
Lafayette Station	542

Jeffersonville, Madison & Indianapolis R. R.

Railroad Depot, Louisville, Ky.	470
Summit Ohio Bridge	508
Jeffersonville	454
Henryville	520
Summit Knobs	630
Scottsburg	583
Seymour	620
White River Bridge	595
Columbus	639
Madison	460
North Madison	886
Dupont	791
North Vernon	677
Columbus	639
Edinburg	683
Franklin	740
Greenwood	840
Southport	810
Indianapolis	721

Cincinnati, Indianapolis, St. Louis & Chicago Railway.

Kindly Furnished by Chief Engineer Morris.

Plum Street Depot, Cincinnati, Ohio	521
Lawrenceburg	508
Weisburg	941
Sunman	1,027
Morris	994
Laughery Creek, (bed)	925
McCoy's, (summit)	1,039
Sand Creek, (bed)	939
Greensburg	954
Flat Rock, (bed)	927
St. Paul	864
Prescott	801
Shelbyville	774
Blue River, (bed)	759

Fairland	768
Sugar Creek, (bed)	762
Acton	804
Gallaudet	864
Poplar Grove	861
Indianapolis, Union Depot	721

On each of these lines the surface of the country at the *greatest elevations is level table land.* Sunman (1,027), on the Cincinnati, Indianapolis, St. Louis & Chicago, Knob Summit (630), Jeffersonville, Madison & Indianapolis, and Smedley (878,) Louisville, New Albany & Chicago, are on the flats. The marked lower depression on the line of the Jeffersonville, Madison & Indianapolis railroad, is the result of glacial action previous to the era now under consideration.

It is the purpose of the writer of this article to examine, as occasion may permit, the country along these and other railway lines, by short lateral excursions from the lines, and with the Aneroid barometer, for measuring elevations, to further determine the topography of the State.

Before discussing the second or table-land section of the State it is proper to remark that Indiana is situated on the western limit of the timber lands of the middle latitudes of the United States, and nature seems to have cared specially to fringe this border land of the great inland prairie sea of Illinois with trees remarkable for abundance, size, beauty and variety.

The following note from Robert Ridgeway, of the United States Corps of Scientific Explorers, is a good description of the timber of one section of the State:

"The mixed woods of the lower Wabash Valley consist of upwards of ninety species of trees, including all of those which reach a maximum hight of over twenty feet; these are distributed through about twenty-five orders and fifty genera. In the heavy forests of the rich bottom lands more than sixty species usually grow together, though in various localities different species are the predominating ones. * * *

"Of the ninety to one hundred species of trees of the lower Wabash Valley, about seventy exceed the hight of forty feet; forty-six (perhaps fifty) exceed seventy feet in hight, and about thirty are known to reach or exceed the hight of one hundred feet. Of the latter class, as many as nine are known certainly to reach, or even exceed, the altitude of one hundred and fifty feet, while four of them (sycamore, tulip poplar, pecan and sweet gum) attain, or go beyond an elevation of one hundred and seventy-five feet! The maximum elevation of the tallest sycamore and tulip trees is probably not less than two hundred feet.

"Going into these primitive woods, we find symmetrical, solid trunks of six feet and upwards in diameter, and fifty feet long to be not uncommon, in half a dozen or more species; while now and then we happen on one of those old sycamores, for which the rich alluvial bottoms of the western rivers are so famous, with a trunk thirty or even forty, possibly fifty or sixty, feet in circumference, while perhaps a hundred feet overhead stretch out its great white arms, each as large as the biggest trunks of more eastern forests, and whose massive head is one of those which lifts itself so high above the surrounding tree tops. The tall, shaft-like trunks of pecans, sweet gums or ashes, occasionally break on the sight through the dense undergrowth, or stand clear and upright in unobstructed view in the rich wet woods, and rise straight as an arrow for eighty or ninety, perhaps over a hundred feet, before the first branches are thrown out."

In addition to the large timber, a characteristic feature of our forests, was a heavy undergrowth of brushwood, and in the marsh lands a luxuriant growth of weeds and grasses.

This undergrowth on the level table lands by necessity hindered the outflow of the surface water: consequently the country generally presented the appearance of great shallow lakes, and to the pioneers were vast marshes only to be avoided.

The early settlers were willing to cut out homes in the heavy timber of the hill country, but they shunned the marshy uplands, hence the southern part of the State is at least twenty-five years older than the northern portion.

The small lateral streams which run into the main rivers of the State take their rise in the table lands, and while this part of the State was uncultivated, the shallow lakes in these table lands furnished a reliable supply of water throughout the year.

Since a large portion of the level lands have been opened by cultivation, and the shallow marshes have been converted into fruitful fields, there has been a notable decrease in the size of the rivers of the State—and this has led to the erroneous conclusion that there has been a serious diminution of the annual rainfall since the first settlement of the State.

White river within the recollection of men yet living was twice the size it now is, and nothing is more common throughout the State than abandoned mill-sites because the water supply has failed.

The drainage of the lakelike sources of the streams is a sufficient explanation of the diminished size of these streams, without resort to the theory of diminished rainfall, which meteorological observations thus far fail to establish.

It is a question of some importance to know whether this diminution has reached its minimum, or whether it will still continue, in the solution of the great problem of water transportation.

The establishment of permanent low and high water marks at a number of points along our principal rivers, would be of great value in determining the question of variations of average size, and consequent value as supplies.

There are yet unredeemed vast tracts of marsh lands in the table.land section of the State. To perfect a system of drainage for this section the best engineering skill will be required.

The *one important fact* in reference to *all these lands* is that they are *high, level plateaus*, and within accessible distance from the larger part of these are the deep and rapid Wabash and White rivers, with their tributaries. The swamps of Boone county are nine hundred feet above the level of the sea. The marshes between Huntington and Fort Wayne are fully one hundred feet above the Wabash, which is only a few miles distant.

English lake and the Kankakee are six hundred and sixty feet above the ocean, one hundred and fifty feet above the Wabash at the mouth of the Tippecanoe, ninety feet above lake Michigan, and two hundred and fifteen feet above the Illinois river at Ottawa. The possibilities are well established, and the solution of the sanitary and economic problem of drainage is reduced to one of cost and engineering selection.

In the preliminary reconnoisance, for the survey in Indiana under the direction of the coast and geodetic survey by the general government, my work required the examination of a section of the State about thirty miles in width extending from New Albany to South Bend.

The results from this work, so far as topography is concerned, are included in the general deduction. stated in this paper.

The full realization of what has been accomplished in the homes and fields of the State, can be experienced only by traveling over the country and seeing farms and farm life as they now are in Indiana.

It is not a surprise to one who has traveled over the State to learn that Indiana stands second in actual millions of bushels of wheat produced, and first, in proportion to size, of all the States in the Union.

The ditch digger and the tile maker have already doubled our productions, and their work is yet but fairly begun.

The fifty millions of bushels of wheat in a few years should be increased to one hundred millions annually, and this will be the result if the full advantages of our ditching laws are appropriated by the people.

The expenses necessary to secure this improved drainage are great, but the direct returns are always greater.

A proper paraphrase is, he who ditcheth sparingly shall reap sparingly, and he who ditcheth bountifully shall reap bountifully.

The Commissioners for Drainage in each county, as now provided by law, have important duties to perform, and for these positions the best practical skill and engineering knowledge is essential.

My plea is for the further recovery of the upland marshes. Nature will do this in time, but the drop of water, unaided, must have ten thousand years to make the Kankakee valley like the Wabash country.

Let the engineer direct the ditch digger to help the streamlet do its work, so we may have in single years what, unaided, water only could accomplish in centuries.

AIR DUST.

*What is It, and What are Its Effects upon the Health of Man and Beast.**

BY GEORGE L. CURTISS, M. D.

A breath of pure air inhaled into sound lungs is a hundred fold more conducive to good health and long life than pounds of drugs and gallons of tinctures poured into the human stomach. A brisk morning walk of a mile in a moderately cool atmosphere, inhaling ten thousand cubic inches of air, is a thousand times more invigorating and appetizing than all the brewed, vinous and distilled tonics one can drink, from hard cider to Irish whisky, or from light wines to fiery brandy.

Air, light and water are Nature's great medicamentum. Air brings health-giving chemicals to act upon the blood, eliminating noxious, wasted parts, and leaving in place life-giving and structure-building elements. Light in some subtle manner changes, renders harmless or kills such foreign poisonous substances as may get into the atmosphere as it can reach by its rays. Water is to cleanse and carry away the dust and dirt accumulations from the person so that the skin by its pores may perform its functions in harmony with the lungs.

You will remember that last year I spoke to you on the subject of "Ponds and Pond Water in Relation to Health and Wealth." At present I desire to speak of air and air dust in relation to health.

Enter an ordinarily tidy room, perhaps you wife's well kept parlor, at once you will say, the air is pure and free from foreign substances. If a ray of bright sunlight chance to fall into the room, you observe in the track of that ray of light an innumerable company of little particles of dust or air-motes floating about. Stand a little way from the stream of air-motes and wave a fan or your hand a few times somewhat vigorously, and observe what a commotion takes place among these air-motes. Their number is seemingly multiplied. They fly in every direction as if chased by mad furies. Many new forms of air-motes appear, and the whole sunbeam is alive with moving matter in a whirl of excitement. Try for a moment to count them; but not those in a cubic inch can be counted. Your room is, say, 15x15x12 feet and contains 4,665,000 cubic inches of space filled with air, which holds in itself at least calculation 500 air-motes to the cubic inch, or 2,332,800,000, in that one room. While looking into that sunbeam with its pathway of air-motes, you are at the time breathing just such air-motes as are whirling about, even though it be in your wife's tidy parlor.

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*Delivered at the annual Agricultural Convention, January, 1882.

If in a well kept parlor the air is so laden with air-dust, what must it be in a great factory of wood working; or a flouring mill crushing five or eight hundred bushels of wheat a day; or in a stave and heading factory; in an immense cotton factory, where hundreds of spindles and scores of looms are running at high speed; in a machine shop where a thousand busy hands are constantly at work on iron, brass, copper, lead and wood; or in a large barn full of hay? Air-dust is composed of exceedingly minute particles of matter of a definite form held in suspension in the air. Their smallness makes them seem insignificant, and their study a very small work; but their insignificance is only apparent. They perform some of the most remarkable and wonderful offices in the domain of animal life. Men and beasts alike are affected by them. King and peasant, millionaire and beggar are together victims to the destroying influences of air-dust. Here is no aristocracy.

It is the study of this air-lading—this air-dust—which men and beasts are inhaling in great quantities, upon which I enter for a season.

PURE AIR.

Pure air is composed of two gases—oxygen in 20 parts, as the vital or life sustaining principle, and nitrogen in 80 parts as a necessary dilutent to the oxygen. Could mankind always breathe this pure, life perpetuating fluid, his diseases would be reduced to a score, and his days, other things being equal, lengthened to a century, and often beyond.

Pure air is an "invisible, transparent, inodorous, insipid, ponderable, compressible, elastic fluid" surrounding the earth to a height estimated at from 35 to 45 miles. In an absolutely pure state it is not found, and I am not certain but the older the world grows, the more impure and pregnant with air dust the air becomes. In this air, filled with its air dust, all land animals including man, live and breathe, just as the water inhabitants live and breathe in water. If the air be filled with anything deleterious to life, it is a logical conclusion that to a greater or less extent all life must be affected unfavorably.

IMPURITIES OF AIR.

1. Carbonic acid gas, existing in great abundance near the earth.
2. Aqueous vapor, as seen in clouds.
3. Inorganic air dust or motes emanating from ashes of wood, coal, soot, pulverized rock, etc.
4. Organic vegetable air dust being dried mould, algae, spores, etc.
5. Organic animal air dust being dried, animalcule, ova, multitudinous epithelial scales from the body, and urine of man and beasts and the baccilla, etc.
6. Emanations from organic matter, as odors pleasant and distasteful, but which are supposed to be invisible.

As to carbonic acid gas in the air, its source of product is largely from decay of plants and animal organism, and the exhalations of living plants. There is even here a compensation in nature, for while living plants are at night throwing off carbonic acid gas, in the day time they are absorbing it, and in some way utilizing it in their growth. There is really but little danger to the animal life and tissues from this noxious gas except under extraordinary circumstances and in special locations.

The aqueous vapor or clouds arise from the continued evaporations of ponds, and from the smoke of burning coal and wood. This sometimes becomes so thick as to obscure the sun, and cast a gloom over all nature. Ordinarily this vapor or cloud does not descend to become in itself a deleterious foreign matter in the air, but after condensation falls in grateful precipitation as rain, washing the air of its air dust.

Inorganic air dust arises from pulverized particles of rocks and earth, becoming lighter than air, and rising to be the sport of the passing breeze. There is also a large quantity of soot from burning coal escaping from the chimneys and forges of the thousands of manufacturing establishments of civilization. The inorganic air dust varies in amount with location from 20 to 50 per cent. of all air dust floating around us. Some may be astonished that particles of rock, ashes, etc., should be held so long in the air, and carried hundreds of miles from the place they once occupied to be precipitated. The ashes of the great Chicago fire are belived to have appeared falling out of the clouds on the decks of two vessels off the coast of Spain, more than 3,000 miles away from the seat of the fire within four days after the great conflagration. When the dust or ashes from the vessels was examined microscopically, it was found to be not the incineration of igneous rocks from some volcano, but from the destruction of vegetable tissue. Organic vegetable air dust comes from shreds of wood, fibers of wool, cotton, flax, silk, grass, leaves, the mycelium of moulds, and all fungus growth as the dried up spores and spore heads, from pollen of the various flowers blooming in their season, fragments of dried algæ, desmidacea, etc. The substances are legion. The air is charged with these motes, many of which may be discerned and accurately studied with a glass of even moderate power.

Organic animal air dust comes from dried up animalcule, and ovum or floating eggs, which only await a suitable time and place to be revivified and hatched, besides epithelial scales from the bodies of people, and the exhalations from the millions of animal and human lungs. The sources of animal air dust are found in each individual animal of the globe, and while some are more prolific sources than others, not one is an insignificant source.

Besides these, there are other somethings in the air, which are the emanation from organic matter both vegetable and animal, sometimes rank, faint and sickening, and again sweet, refreshing, exquisitely thrilling, and delightful as the breezes of Ceylon, or as balmy as Araba's zephyrs. They are called odors, but just what an odor is no one can tell, being invisible and intangible except to one sense. These odors have not been critically studied, for at present we have not instruments of sufficient delicacy with which to conduct an examination, but I doubt not ultimately we will have. Of this class of air dust I do not take cognisance.

Inorganic and organic animal and vegetable motes form the bulk of all air dust, called by Prof. Collett, State Geologist of Indiana, "air filth." Here opens a vast field of research.

METHODS OF EXAMINING AIR DUST.

These methods are various. One is more complete in its results in the hands of one experimenter than another, but whatever line or mode of study one may enter upon, it must be followed patiently, year after year, when its results, which will be surprising, will very well agree with the conclusions of other patient, painstaking investigations by other methods.

Dr. Tindall in "fragments of science" has given his method of air study, and also of Mr. Pasteur, Mr. Pouchet and Dr. Bennett.

Several flasks of distilled water were prepared and hermetically sealed, and known to be absolutely free from all animal and vegetable matter. Some of these were taken to the deep caves of the Paris observatory, and left open some days, when only one of ten showed animal and vegetable life. Others were opened in the court yard, and speedily life appeared. Several bottles were taken to the Alps, and Pyrenese, and the results were alike. Bottles unsealed at the foot of the mountains soon were alive with millions of animal and vegetable growths. Upon the mountain side other flasks were unsealed, and on exposure for a few days to the atmosphere, there was found a prodigality of life. High up amid the snows and ice several other flasks were opened, when it was found that those opened in the hand, while the wind was blowing past the operator towards the bottles, could soon develop life, both animal and vegetable, while those opened with the breeze blowing past the bottle towards the operator did not develop animal or vegetable forms. This demonstrated two things; 1st, that the clothing is a first-class medium for transportation of germs, ova, and fungi spores; and 2d, that the higher we ascend the fewer the forms of organic air dust. These results were also observed by M. Pouchet on the Pyranese. It was found that in nineteen out of twenty cases, when the flasks were opened, with the air blowing from the bottles to the operator, the glacial air was incompetent to produce animalcule, being so nearly free from air dust.

MY METHOD OF STUDY.

I will give you my method of studying and experimenting in this line for the past three and a half years. It has been mostly microscopical, though at times by transmitted light in an air chamber.

After preparing and cleansing by hot water and alcohol a large number of slides, I left them exposed, lying flat in various rooms, offices, places of business, stables, factories, warehouses, cellars and privies. After from five to ten days I gathered them, and carefully mounted them, marking time, place, and general character of the place where found. These slides I subjected to a careful microscopical examination. The process was tedious and trying, but its results gratifying to myself. At the outset, I found it necessary to have some standards of observation and comparison. These I set about making, which occupied about six months time. But success crowned patient labor. To make my standards, I obtained fibers of silk from the cocoon, and prepared specimens of these, and became familiar with these forms. I next went over the house, cellar and stable, and gathered all the little nests of larva I could find, and examined the fibers around these, and discovered a striking family likeness among all cocoons. I then took fibers of wool and treated them in the same way, also fibers of cotton from the cotton bole, and from cotton fabrics. These I compared with thistle down, lacticarium, and fibers from the milk weed pod, etc. Here again, by comparison, I was enlarging my field of observation. Then I examined various ashes, and soot from coal and wood, from hard and soft coal, until able to distinguish between soot and ashes. Inorganic dust particles I obtained from the impalpable clouds of dust rising in the streets.

To study wood fibers, I took raspings from all kinds of woods within reach. Here, at times I was almost discouraged, but after a time came to a good understanding of wood fibers, both hard and soft, and wood dots, and sometimes forms of rock substances, especially silica, carried up by the sap. To obtain a knowledge of fragments of algæ and fungi, I evaporated pond water on slides and pulverized the remains, and by examination had some splendid specimens of broken algæ, desmidaciæ, together with fragments of animalcule. I treated various slides covered with algæ and animalcule with quinine, chinconidia, solutions of arsenic and other poisons, to detect the different effects and appearances.

Armed with the results of these observations and comparisons, I proceeded to the more extended study of air dust, as observed on slides obtained from the various places where they had been left.

On a slide left five days in a heading factory where soft woods, aslynn, elm and a small quantity of poplar are manufactured into barrel headings, was a large accumulation of air dust, which, under the microscope, revealed the most beautiful specimens I ever saw of soft wood fibers, together with wood dots and cross-sections in innumerable quantities. At least eighty per cent. of this air dust was wood fiber. When hard wood is manufactured the hard wood fibers will be seen to the exclusion of many other forms of air dust. In and around this building there was floating a constant cloud of this impalpable air dust, in which men were working, and inhaling into their lungs with every inspiration.

On slides left in a well-kept kitchen, a sitting room, a parlor, sleeping room and cellar of the same house, the microscope revealed most shriveled vegetable and inorganic air dust in the kitchen, most fungi, mycelium and algæ in the cellar, most wood, cotton and woolen fibers in the sitting and sewing room, much of cotton, linen and woolen fibers together with animal tissues, probably from night exhalations, in a sleeping room, and a large preponderance of inorganic air dust in the parlor.

On slides left seven days in two wards of a hospital, one in a fever ward, and the other in the convalescent ward,—on the one in the convalescent ward there was a greater proportion of inorganic air dust, with cotton fiber, and traces of animal tissue, probably from the lungs. On the slide from the fever ward, where there were nine cases of typhoid fever at the time, there was inorganic air dust, some cotton fiber, and a number of heads filled with spores. These were similar to sporeheads and spores of other fungi. I am inclined to think these are what other examiners have called fever germs. At any rate I have never found them anywhere but in close proximity to fever cases.

On a slide taken from a hay loft after six days' exposure was fifty per cent. of inorganic air dust, some light hay seed, many spore heads, much vegetable fiber, and dried up and indefinable substances, which would develop into the same as may be obtained from steeping a little hay for a few days. It was shown, also, that the amount of the spores depended upon the manner of curing and mowing away the hay. Clean, sun-aired hay develops far less air dust than poorly cured, half rotten hay.

Each occupation has its own kind of air dust, mingled with the inorganic, common to all. Among metal workers in a machine shop the air is largely metalic, as may be shown by the magnet under the lense. In a cotton factory the atmosphere is charged with cotton fibers; in a woolen factory with wool fibers; in a silk factory with silk fibers; in a junk shop with hemp fibers. In a room where old iron scraps are stored the air will be charged with red rust; while in a shop for manufacturing gold jewelry, the prevalent air dust will be particles of gold. A set of slides from these different occupations placed before an expert will not deceive him as to their origin.

On a slide left eight days in a church, used during the time for four public services, and swept and dusted twice, the air dust was inorganic by about eighty per cent., showing that after all a church is a healthy place to visit.

The office, the library, museum, court room, hospital, prison, grocery, the wholesale house, the foundry, kitchen, cellar, hut, the stable, the cave, etc., while having in common certain forms of air dust, have each their own peculiar air dust. So, on the farm, the open field, the tilled field, the fallow ground, the pasture, the wood land, the swamp and marsh have each their distinctive air dust. It may yet be proven that pear blight, grape blight and potato rot are but certain and specific forms of mildew, or ova, or dried animalcule floating as air dust, and only awaiting a suitable resting place and nature's pabuelum to burst into life again.

Have you never, when crossing a field, picked up a puff ball and pinched it to see the cloud of dust fly out of it? That dust, when collected on a slide and viewed with a microscope, is found to be vegetable spores or seeds, each one capable of producing a puff ball next year. These fly in the air, to go anywhere the wind may carry them to propagate their kind. So the corn smut is a fungus full of infinitessimal spores, each of which is capable of producing another bunch of corn smut with its millions of spores. These being so light float out on the air and become air dust, to repeat the process of growth, formation of ripe spores and their dissemination.

Each season has its specific air-dust, though in all seasons some of the same forms are present. It is a study of great interest, and no little wonder, to commence with January and go around to January again, and collect and examine slides each week, and place them in comparison. At some points the transition from one form of air-dust to another would be very gradual, while at another place it would be very abrupt. These changes depend somewhat upon meterological changes, as well as the advancing season. Out of such a study could be determined some of nature's laws for successfully doing many, indeed most, of the necessary works of life, so as never to have abortive results.

AIR DUST IN STRATA.

Air dust is found in strata. Just as carbonic acid gas will seek the lowest places, so will the air dust range itself according to the law of gravitation. The heavier and greater quantity of air dust is lowest, while the lighter forms float higher. As we ascend, the purer, or more free from air dust does the atmosphere become. An ascent of but a few feet will show these changes. Hence we can somewhat account for the fact that in some localities those who sleep on the first floor may have chills and fever, while those sleeping fifteen feet higher may not be so affected. Fever germs being heavy sink into a lower strata. Cellars are far more dangerous than garrets.

An ascent of 100 feet will reduce the air dust full 40 per cent. In a series of examinations made at the Indianapolis court house, I found that the slides left nine days on the dome were very free from organic air dust. Principally it was inorganic air dust, such as soot from the clouds of smoke, and a few vegetable fibers. At the same time slides left for five days within five feet of the ground, had adundance of animal and vegetable air dust. Not having any other elevated place on which to conduct my experiments, I could not determine the differences of air dust at different elevations. I do not doubt the same results will be obtained whenever air dust at different altitudes is studied.

Mr. Hogg, an eminent English microscopist, writes a few observations in harmony with my view on this point, though they are incidentally given. "It appears" he says, "that at particular periods of the year the atmosphere is, so to speak, more fully charged with the various spores of fungi than it is at others. The spores of the moulds *aspergillius penicillium*, and *puccinia* are perhaps the most widely distributed bodies, and towards the end of the hot weather, or about autumn time, they are very abundant. Among those who have taken them at this period of the year, we must ever associate the name of the Rev. Lord Godolphin Osborne, who first experimented in this direction during the cholera visitation of 1854. He exposed prepared slips of glass, slightly moistened with glycerine, over cesspools, gullyholes, etc., near the dwellings of those where the disease appeared, and caught what he termed *aerozoa*—chiefly minute germs and spores. A drawing made from one of these glasses, exhibits spores almost identical with those found on the human skin."

"From the year 1854 to the present time," continues Mr. Hogg, "we have amused ourselves by catching these floating atoms, and so far as we can judge they are found everywhere, and in every conceivable thing, if we look close enough for them. Even the open mouth is an excellent trap; of this there is ample evidence." (Hogg, p. 295.)

In my searches of air dust I am sure I have found a variety of spores, fragments of algæ, the mycelium and stalks of fungi, full formed and ripened spore heads, scales that have all the form and physical characteristics of epithelial scales, scales and broken down tissue such as comes from the lungs by expiration, besides great quantities of wood fiber, and many as yet undistinguishable substances. Mr. Hogg, the microscopist (p. 453), in speaking of the *rotifer*, an abundant animalcule of ponds, ditches and cess-pools, says: "In the atmosphere the eggs have been discovered whirling along by the force of the wind to some resting place, where, when circumstances admit, they spring into active life and fulfil their appointed destiny."

AIR DUST FULL OF LIVING ORGANISMS.

That air dust is full of living organisms and their eggs, or of mould and its spores, can be shown by another set of experiments. Take two pieces of meat from the same beef. Place one in a bottle and heat it until it is cooked. By this process all air dust of animal or vegetable character is destroyed. Seal the bottle of meat and it will remain sweet and pure for any number of years. Cook the other piece of beef until well done, and let it stand a few days, when it decays, moulds and becomes offensive, breeding worms and animalcule. Make a microscopical examination of any portion of this spoiled beef, and see how it is covered with fungi and swarms with a teeming population of living and active animal organisms. Where could this mould and animal life have been born? You have carefully kept all mould away from it, yet it moulds and spoils. You have allowed no infusorial life to approach it, yet infusoria bud and grow in numbers alarmingly numerous. These vegetables must have come from the spores floating in the air, while the animal forms have arisen from the same prolific source.

Through the air are scattered a minute living chain-like form called bacilla, familiar to microscopists. Their number is so great that mathematics becomes dizzy in its attempts to tell how many there are. These are so small in the ordinary form that twenty-five thousand of them would be required to be placed side by side to make an inch in length, while some of the smaller are so infinitesimal as to require a glass magnifying 5,000 diameters to discover them. These active, unseen, living organisms floating everywhere, falling upon everything, will find after a time a proper home for revivification, and hatching, and soon cause that to decay upon which they fall. But for these and kindred organisms of air dust with which the air is charged, fruit would not sour and decay, eggs would not become foeted but remain pure and fresh, meat would not taint, but as on the sandy plains where baccilla, spores and ovum are not found, would hang in the open air and never decay.

AIR DUST AND INFLAMMATION.

The presence of air dust is one of the most prolific known causes of inflamatory action in case of wounds. It has long been known that any rupture of the tissues of the body without breaking the skin, would recover without inflammatory action. The surgeon has learned to evacuate an abscess in all cases where possible by using a needle and aspirator, for by that means air will not be introduced into the cavity of the abscess. Should air be introduced, in a few hours inflammation will follow, and a sloughing sore be formed. Hence, exclude the air from all wounds. What produces this surgical inflammation? Is it pure air? No, I think not, but the impure air dust with its fungi spores, its baccilla, and micrococci which taking their life from the lips of the wound, immediately causes a complete corrupt condition of the parts.

Taking a hint from this surgeons have sought to disinfect the air around them and the patient when performing a severe or capital operation, and also by heat or cold disinfect the instruments used. Says Dr. Leister of Edinburgh University:—"These particles of dust will be pretty sure to contain the germs of putrefactive organisms," and if one such enters the wound "it will rapidly develope at the high temperature of the body," and produces putrefaction. Dr. Leister, to accomplish his purposes, when performing a surgical operation, surrounds the wound with spray of diluted carbolic acid, "which is particularly deadly to the germs." His dressings of wounds are "antiseptic bandages." The result of this course is always satisfactory. "In his hospital practice, even in the midst of abominations too shocking to be mentioned here, and in the neighborhood of wards where death was rampant from pyæmia, erysipelas, and hospital gangrene, he was able to keep his patients absolutely free from these terrible scourges."

Says Dr. Tyndall: "The advocates of the germ theory, both of putrefaction and epidemic disease, hold that both arise, not from the air, but from something contained in the air. They hold, moreover, that this something is not a vapor nor a gas, nor indeed a molecule, but a particle." This particle is an element of air dust, and by its inhalation produces disease. Take a case of pertusses or whooping-cough, which is found to be caused by a microscopic fungus, locating itself in the mouth by the side of the tongue, and commences growing over the tongue and down the throat, which, by its irritation causes spasms of coughing and whooping, in nature's attempt to be rid of it. Where such a child is the air is charged with the fungus spores, and another person who has never had whooping-cough by which the peculiar sensitiveness of nature to its contamination is removed, will take it by inhaling the spores floating in the air, which lodging in the mouth, nature's place for it, soon develops into a marked case of whooping-cough. So with small-pox, measels, chicken-pox, scarlet fever, etc. These diseases are most certainly contracted by air-dust inhaled into susceptible throats and lungs.

I may refer to the report of Dr. Salmon, on the Southern cattle fever, published by the Department of Agriculture of the United States, in 1880. This disease is an "exceedingly fatal epizootic;" it is a "specific communicable fever of cattle." After a long and patient investigation he found it to be communicated to cattle, not by the touch of the infected, or anything that the cattle could eat that belonged to or came from the infected. He found that when a creature had died in a barn, or been sick, and was removed from it, and afterwards a healthly creature was placed in that stable, it would soon be infected, sicken and die of the same fever. How could this occur? There is no explanation except on the principle of germs of disease in the air dust of that particular locality, not having been destroyed. Such were the conclusions of M. Pasteur and of M. Best, regarding this fever.

I could recite many interesting facts of scarlet fever and other diseases arising from air dust.

ILLUSTRATIONS.

That an overabundance of air dust may be injurious to health and prejudicial to life may be shown conclusively by an appeal to facts. At the extensive sandstone quarries at Berea, Ohio, where grindstones are turned on lathes appropriately arranged, the atmosphere around the works is laden with an impalpable dust, consisting of motes of sand rock, sharp as diamond dust, and in numbers exceeding the millions. The workmen are constantly inhaling these, and many soon die of a peculiar phthisis, known locally as the "turners' consumption." On a post mortem the air cells of the lungs are found charged with this same gritty diamond dust, which they have so constantly inhaled.

For many years the workers in French buhr stone have been deemed short lived, because of the continued inhaling of buhr grit.

Dr. L. Dennis, in describing the manufacture of felt hats, and the diseases incident to the workmen, in speaking of the department where the materials are mixed, says: "In this department the air is constantly charged with dust, so dense and heavy that everything is viewed through a cloud, and a stay of a few minutes in the room produces in one unaccustomed to it a sense of dryness and unpleasant tingling in the nasal passages, with discharge of mucus, which lasts for several hours after leaving the building. Even the next day, sixteen hours after spending about forty-five minutes in the room, the mucus discharged from the nose was discolored with the same dust as on the previous day on leaving the factory, showing that it had penetrated very deeply between the folds of the mucous membrane. The dust is loaded more or less with finely divided particles of nitrate of mercury." These workmen suffer largely from "catarrh, bronchitis, chronic coughs, spitting of blood, and loss of flesh," besides some suffer with "sore mouth and tremors."

"Dust of every kind irritates, but not in an equal degree. Much, I conceive, depends on the size and figure of the particles which enter the air tube. The dust from the roads produces no apparent mischief, while the mason's chippings from the stone occasions serious and often fatal injury to his lungs. The dust from old iron, which is thrown off so copiously as to deposit a thick, brown layer on the dress of the dealers in this article, produces no inconvenience, while the less apparent detachment of particles by the file is decidedly baneful to the workers in iron. It is, then, the form rather than the material—the spicular, the angular or pointed figure of the particles detached, which we conceive the chief cause of injury. The bronchial membrane is mechanically initiated or wounded, and from daily repetitions of this injury the lungs at length become seriously diseased." (Scientific American Supplement, No. 191.)

COMPENSATION OF GOOD FOR THE EVIL OF AIR DUST.

Is there no compensation of good to over balance this evil in the presence of air dust? Make a box of glass air tight, having openings on each side, into which are fixed glass tubes. Before proceeding, pass a ray of light, either sun, calcium or electric light through the air chamber, and its track will be visible through the space of the chamber, and the air dust will be seen in great abundance.

Pass a current of burnt air by a pair of bellows through a flame and into a tube, and wash in water chambers, and from thence to air chamber. Let surplus of air pass out at tube, passing through water so there can be no return of air. Continue this process until the air chamber has been emptied and filled half a dozen times, when it will at last be filled with absolutely pure air, free from all air dust or air filth. Now you may pass your ray of light through the chamber of pure air, and its tracks is unmarked, though outside of the chamber it is well marked. The reason why its track is not marked within the chamber is, there exists no air dust to become illuminated and reflect the light and show its track. Pure air does not reflect light, but air dust will. If now by the side of the first air chamber I place a second, and instead of blowing into it burnt air freed of air dust, I blow into it a quantity of air dust until I have charged it so that the air dust is visible as a cloud, and I pass a ray of light through it, in a moment it becomes visible, even to radiancy, while the chamber by its side filled with air free from air dust is dark as midnight. Somehow the air dust has to do with the proper diffusion of light.

It is said, that if we stand on the highest peaks of the Hymalaya or Chimborazo, amid eternal snow and silence, as the sun is shining down, it seems to be shining out of darkness and blackness. Its light is sharp and piercing, while the atmosphere is but little illuminated. There is evidently some lacks of ærial substance to give to that sharp light its proper diffusion and mellowness. Come down to the plains and valleys, where air dust is thickest, and the same light has assumed a new phase. It has lost its sharp and piercing character, and assumes a mellow, softened form. Our dusty air chamber tells us the secret. Some air dust is a necessity to an equal softening and thorough diffusion of light.

WHENCE COMES AIR DUST?

At present this can not be fully answered, for the reason too few observations have been made. But, as to some of it, an intelligent answer can be given.

The cotton, wool and wood fibers in a manufacturing town largely come from the factories. The wear and tear of clothing will account for a great part of the cotton and wool fibers found in every place. Remember that on an average one suit of clothes is worn out by each man, woman and child a year. This wearing is the constant removal of a fiber at a time from the texture. In no other way does cloth wear out. If you will retain each fiber in its place, the goods will be imperishable. But the fibers are being constantly worn away, like rock is worn down by attrition. These fibers escape into the atmosphere and are sportively tossed about by the breezes. After a time, when a calm prevails, these air motes settle down to earth, or rest on chairs, tables, stands, or attach themselves to walls. The neat housewife, shocked at the sight of dust, brushes, sweeps, dusts to be rid of the air dust, and by so doing again *raises a dust*. Her method of dusting is wholly unscientific, and never tends to lessen the amount of air dust, but makes it again a nuisance.

The fragments of algæ, spores of water plants and fungi, eggs of animalculæ and dried animalcule themselves as air dust arise from dried up ponds, pools, ditches, eaves of houses, street gutters, etc. The substance when once moist were heavy, but drying out become light and are lifted by the wind into the air and are readily breathed. The fragments of moss, seeds and spores of ferns, the parasites of men and beasts, have a home everywhere, and none need wonder where they arise from. Then there are unquestionably disease spores, as fever germs, germs of pertussis, diphtheria, cholera, measels, scarlet fever, and kindred affections. These seem to come and go, some at least, like fish in the sea, in schools, and for a time these diseases prevail. At other times there may be single cases, called sporadic, which may have resulted from some hidden spore, left by a former school of disease, now dislodged and revivified and producing disease. The air, water, the touch, foul clothing and untidy houses are great mediums for disseminating disease and death.

Air dust is an attendant upon air, not a part of it, just as noise always attends the running of machinery, but is no part of machinery.

HOW PREVENT AIR DUST?

How can we prevent the pollution of the atmosphere by air dust, and how prevent sickness and disease being so prevalent through the agency of air dust? Can there be any prevention?

I think a large part can be prevented. Our horses and cattle need not be compelled to inhale so constantly impure air charged almost to suffocation with poisonous air dust. A careful cleansing of barns and stables three or four times a year, removing all rubbish, refuse, dead and decaying vegetable matter breeding moulds, such as accumulates around a barn or stable, sweeping down cobwebs, using a plentiful amount of whitewash, and for the balance of the year paying attention to general cleanliness, would free the world of very much of the air dust now so disagreeable to man and beast. A barn needs barn-cleaning-days oftener than a house needs house-cleaning-days.

Another means of prevention is found in a better, more scientific curing of hay and grain for feeding cattle and horses. Large quantities of hay, as now cured and put up, are spoiled, or partially so, insomuch as to be an inferior article. As a result, it is heavily charged with mould spores, mildew, and multitudinous forms of air dust, greatly to the detriment of the stock that feed upon it, as well as inhale the dust arising from it. Some of the air dust of cities may be removed by sprinkling the streets, yards, and around barns. Rain washes the atmosphere of its air dust, and is one of nature's appointed purifyers. Let the air be ever so highly charged with air dust, organic or inorganic, then let there come a smart shower with lightning and thunder, and as the rain falls through the air it washes it of its impurities, and cleanses it of its air dust, just as water poured through soiled linen cleanses away the impurities.

Better understanding of the necessities of ridding ourselves of air dust, will lead owners of great factories and shops to improve their machinery for carefully and certainly burning the air dust, and supplying pure air to the workmen. It is a marvel to me how men can live a year shut up in close shops with an impalpable air dust around them. It is true, nature has provided breathing animals with a fine apparatus for sifting air as it passes the nostrils, but it can not do all, or a fourth of the work required.

This is a dusty world, and it is our work to seek for methods of allaying dust and securing pure air.

COMMERCIAL FERTILIZERS.*

BY PROF. H. W. WILEY, OF PURDUE UNIVERSITY, STATE CHEMIST.

On April 15, 1881, an "Act to regulate the manufacture and sale of Commercial Fertilizers" was approved.

This act provides for the appointment of a State Chemist and prescribes his duties.

The Professor of Chemistry of Purdue University is made State Chemist and is required to make a chemical analysis of all fertilizers which are to be offered for sale in the State of Indiana. The State Chemist is required to furnish to manufacturers and dealers, labels setting forth the results of his analysis, viz:

"The ingredients contained in the preparation, showing particularly in an available form, the percentage therein contained of nitrogen or its equivalent in ammonia, of potash soluble in water, of soluble and reverted phosphoric acid and of insoluble phosphoric acid, with the certificate of said chemist that the foregoing is a true and complete analysis of the sample furnished him, and shall furnish to one or more agricultural papers published in the State a true copy of the analysis." (Sec. 2.)

"Every box, barrel, keg or other package of any substance or any quantity of any substance in any shape or form whatsoever, sold or offered for sale as a commercial fertilizer, shall have attached to it in a conspicuous place a label containing a certified analysis made by the State Chemist from a fair and true sample of the substance to which such label is attached, as provided in the foregoing section of this act." (Sec. 3.)

"Any person who shall sell or offer for sale as a commercial fertilizer, any box, barrel, keg or other package of any substance or any quantity of any substance, in any shape or form whatever, which shall not be labeled with the State Chemist's analysis, as herein before provided, or which shall be labeled with a false or inaccurate analysis, shall be deemed guilty of a misdemeanor, and on conviction thereof shall be fined in the sum of fifty dollars for the first offense, and one hundred dollars for each subsequent offense." (Sec. 4).

"The term 'commercial fertilizer' as used in this act shall be taken to mean any and every subtance imported, manufactured, prepared or sold for fertilizing or manural purposes, except barnyard manure, marl, lime and wood ashes and plaster." (Sec. 6.)

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* Delivered at the Agricultural Convention, January, 1882.

"Before any person shall sell or offer for sale in this State, any commercial fertilizer for manural purposes, he shall furnish to the State Chemist of this State a quantity of such commercial fertilizer sufficient for analysis, accompanied with an affidavit that the substance so furnished is a fair and true sample of a preparation which the person so furnishing desires to sell in the State of Indiana for manural purposes." (Sec. 1.)

I have given sufficient extracts from the law to show its general scope, and to give an outline of the duties of manufacturer, dealer and State Chemist.

The law did not go into effect until September, 1881, and hence could not be applied to the fertilizers used in the fall trade throughout the State. It is probable that many hundreds of fertilizers were sold after the law became active, in which sales the provisions of the law were wholly disregarded.

Inasmuch as the duties imposed on the State Chemist by the provisions of this law, were of such a nature as to employ all of his time, the trustees of the university employed Mr. G. L. Spencer, a graduate of the university, to assist him in the analysis.

A special room was fitted up for the State work, and postal cards were sent to all manufacturers and dealers whose names I could secure, giving an epitome of the law, and calling particular attention to the article regulating the sale of fertilizers in the State.

In response to this information about a dozen firms up to date have sent specimens for analysis. The total number of samples analyzed up to date is thirty-eight, of which Nos. 17 and 18 were land plaster, and not amenable to the law. Nearly all these analyses have been made in duplicate, making a total of seventy-six analyses up to the present time. To make a single analysis requires nearly three days for one person working ten hours a day; by carrying on three or four together, however, this time may be somewhat shortened.

Taking account, however, of the time occupied in fitting up the room and in making special preparation for the work, not far from two huudred working days of ten hours each have been employed.

Few persons realize the amount of labor employed in making a single analysis. As this, however, is better appreciated more regard will be had in the law for compensation for the work.

The chemicals moreover used in the analysis, especially the molybdic acid, the soda-lime, the nitric acid, and the ammonia are very expensive, and the fee allowed for analysis will only about pay for the chemicals and gas consumed.

The method of analysis employed has been that agreed upon by the Agricultural Chemists in their meetings in Washington, Baltimore and Cincinnati.

The moisture is estimated by drying for two hours at 125° Centigrade. Soluble phosphoric acid is removed by washing with water on a filter until the filtrate ceases to have an acid reaction.

Reverted phosphoric acid is determined by treating the residue from the sample used for determining soluble acid and warming it for thirty minutes with a solution of citrate of ammonia, sp. gr. 1.09. The temperature is kept during this process at 40° Centigrade. The phosphoric acid soluble in citrate of ammonium treated in this way is what is known as "reverted phosphoric acid." The acid left after treatment with citrate of ammonium is also determined and entered as "insoluble phosphoric acid." All phosphoric acid determinations are made by previous precipitation with ammonium molybdate.

The total amount of phosphoric acid in the sample is also determined. From this the amount soluble in water and the amount insoluble are deducted. The difference is the amount of reverted phosphoric acid present. Soluble and reverted phosphoric acid are generally reckoned together, and called "available phosphoric acid." But insoluble phosphoric acid, especially when derived from bones, is also "available," only it acts much more slowly than the other varieties.

The ammonia is determined by combustion with soda lime. This process gives not only the free and combined ammonia which may be present, but also converts all hair, horn or other nitrogeneous bodies into ammonia. In this way a sample often will show more available ammonia by analysis than it really contains. As is well known, hair and horn decay but slowly, and they ought not to have the same value attached to them as nitrogen already in the form of ammonia. Oxide of potassium or "potash" as it is usually called, is estimated by exhaustion with water and precipitation with platinic chloride. While the method of analysis here outlined may not be the best, I find it the *best* in the circumstances, and with proper care it yields perfectly reliable results, except as to reverted phosphoric acid and amount of available ammonia. I am inclined to think that "reverted phosphoric acid" is a wile, not perhaps of the evil one, but of the shrewd dealer to increase the apparent amount of available phosphoric acid in his wares. One thing is quite certain, viz., the soil does not contain any ammonium citrate which can be used to dissolve the "reverted" acid. I hope ere another year to see "reverted phosphoric acid" removed from our statute.

I have furnished you, as you request, with a detailed account of the analyses made, and also a tabulated statement which may be found valuable for reference.

I enclose also a sample "label," such as furnished to all dealers. Purchasers should see that all parcels of fertilizers contain one of these labels.

I will not discuss here the merits of our law, as compared with similar laws in other States. It will be enough to say that I have done all in my power to make the law effective; have studied carefully its merits and defects, and will be glad to lay my views on this subject before the committee on agriculture of our next legislature.

In regard to the estimated values of the specimens analyzed, I have adopted the schedule of prices in use in Ohio. There can be but little difference in intrinsic value in the two States.

As will be seen by the annexed tables, many of our analyses are of different samples of the same fertilizer. Each analysis is marked by a "station number," and this number also appears on the printed label.

I hope that the "fertilizer law" may receive the hearty support of both manufacturers and farmers, and that it may secure that immunity from fraud and imposture which it was designed to obtain.

Sample of Label for Fertilizer.

% Sol. Phos. Acid.	2.33	L. L. Crocker, Buffalo. No. 27. Ammoniated Bone—Super Phosphate.
% Insol. Phos. Acid.	7.19	
% Reverted Phos. Acid	2.87	
% Ammonia (H_3N)	3.57	
% Potassa (K_2O)	1.13	

H. W. WILEY, State Chemist.

Purdue University, Lafayette, Ind.

ANALYSES OF FERTILIZERS.

Purdue University, Office of State Chemist,
Lafayette, Ind., 1882.

No. of Analysis—1.
Name of Fertilizer—Garden City Super-phosphate.
Manufacturer—Northwestern Fertilizing Company, Chicago.

Per cent. of moisture,	16.16
Per cent. of soluble phosphoric acid	7.08
Per cent. of insoluble phosphoric acid	3.33
Per cent. of reverted phosporic acid	1.29
Total per cent. of phosphoric acid	11.70
Per cent. of ammonia	1.89
Per cent. of potassium oxide,	1.35

ESTIMATED VALUE PER TON.

Ammonia, 37.8 lbs., at 17½ cents,	$ 6 62
Soluble and reverted phosphoric acid, 167.4 lbs., at 10 cents,	16 74
Insoluble phosphoric acid, 66.6 lbs., at 6 cents,	4 00
Potassium oxide, 27 lbs., at 6 cents,	1 62
Total value,	$28 98

No. of Analysis—2.
Name of Fertilizer—Challenge Corn Grower.
Manufacturer—Northwestern Fertilizing Company, Chicago, Ill.

Per cent. of moisture	15.33
Per cent. of soluble phosphoric acid	6.72
Per cent. of insoluble phosphoric acid	1.94
Per cent. of reverted phosphoric acid.	3.05
Total per cent. of phosphoric acid	11.71
Per cent. of ammonia.	2.51
Per cent. of potassium oxide	1.48

ESTIMATED VALUE PER TON.

Ammonia, 50.2 lbs., at 17½ cents	$8 78
Soluble and reverted phosphoric acid, 195.4 lbs., at 10 cents	19 54
Insoluble phosphoric acid, 38.8 lbs., at 6 cents.	2 33
Potassium oxide, 29.6 lbs., at 6 cents	1 77
Total value	$32 42

No. of Analysis—3.
Name of Fertilizer—Fine Raw Bone.
Manufacturer—Northwestern Fertilizing Company, Chicago, Ill.

Per cent. of moisture	10.10
Per cent. of soluble phosphoric acid	0.00
Per cent. of insoluble phosphoric acid	21.47
Total per cent. of phosphoric acid	21.47
Per cent. of ammonia.	3.63
Per cent. of potassium oxide	0.00

ESTIMATED VALUE PER TON.

Ammonia, 72.6 lbs., at 17½ cents	$12 70
Insoluble phosphoric acid, 429.4 lbs., at 6 cents	25 76
Total value.	$38 46

No. of Analysis—4.
Name of Fertilizer—National Bone Dust.
Manufacturer—Northwestern Fertilizing Company, Chicago, Ill.

Per cent. of moisture	16.59
Per cent. of soluble phosphoric acid	4.87
Per cent. of insoluble phosphoric acid	2.17
Total per cent. of phosphoric acid	7.04
Per cent. of ammonia	3.29

ESTIMATED VALUE PER TON.

Ammonia, 65.8 lbs., at 17½ cents	$11 51
Soluble and reverted phosphoric acid, 97.4 lbs., at 10 cents	9 74
Insoluble phosphoric acid, 43.4 lbs., at 6 cents	2 60
Total value	$23 85

No. of Analysis—5.
Name of Fertilizer—Bone Meal.
Manufacturer—Peter Henderson, New York City.

Per cent. of moisture	4.64
Per cent. of insoluble phosphoric acid	15.80
Total per cent. of phosphoric acid	15.80
Per cent. of ammonia	4.27

ESTIMATED VALUE PER TON.

Ammonia, 85.4 lbs., at 17½ cents	$14 94
Insoluble phosphoric acid, 316 lbs., at 6 cents	18 96
Total value	$33 90

No. of Analysis—6.
Name of Fertilizer—Blood and Bone Fertilizer.
Manufacturer—Peter Henderson, New York City.

Per cent. of moisture	11.21
Per cent. of soluble phosphoric acid	0.71
Per cent. of insoluble phosphoric acid	4.42
Total per cent of phosphoric acid	5.13
Per cent. of ammonia	8.90
Per cent. of potassium oxide	1.96

ESTIMATED VALUE PER TON.

Ammonia, 178 lbs., at 17½ cents	$31 15
Soluble and reverted phosphoric acid, 1.42 lbs., at 10 cents	0 14
Insoluble phosphoric acid, 88.4 lbs., at 6 cents	5 30
Potassium oxide, 39.2 lbs., at 6 cents	2 35
Total value	$38 94

No. of Analysis—7.
Name of Fertilizer—Guano.
Manufacturer—Peter Henderson, New York City.

Per cent. of moisture	8.49
Per cent. of soluble phosphoric acid	5.32

Per cent. of insoluble phosphoric acid	10.62
Per cent. of reverted phosphoric acid	1.00
Total per cent. of phosphoric acid	16.94
Per cent. of ammonia	6.00
Per cent. of potassium oxide	0.82

ESTIMATED VALUE PER TON.

Ammonia, 120 lbs. at 17½ cents	$21 00
Soluble and reverted phosphoric acid, 126.4 lbs. at 10 cents	12 64
Insoluble phosphoric acid, 212.4 lbs. at 6 cents	12 74
Potassium oxide, 16.4 lbs. at 6 cents	98
Total value	$47 36

No. of Analysis—8.
Name of Fertilizer—Fertilizer from refuse of Slaughter House.
Manufacturer—Chas. E. Hall, Indianapolis, Ind.

Per cent. of moisture	3.95
Per cent. of insoluble phosphoric acid	20.42
Per cent. of reverted phosphoric acid	0.84
Total per cent. of phosphoric acid	21.26
Per cent. of ammonia	4.73

ESTIMATED VALUE PER TON.

Ammonia, 94.6 lbs., at 17½ cents	$16 55
Soluble and reverted phosphoric acid, 16.8 lbs., at 10 cents	1 68
Insoluble phosphoric acid, 408.4 lbs., at 6 cents	24 50
Total value	$42 73

No. of Analysis—9.
Name of Fertilizer—Ground Bone.
Manufacturer—Chas. E. Hall, Indianapolis, Ind.

Per cent. of moisture	3.58
Per cent. of insoluble phosphoric acid	16.03
Per cent. of reverted phosphoric acid	4.10
Total per cent. of phosphoric acid	20.13
Per cent. of ammonia	4.43

ESTIMATED VALUE PER TON.

Ammonia, 88.6 lbs., at 17½ cents	$15 50
Soluble and reverted phosphoric acid, 82 lbs., at 10 cents	8 20
Insoluble phosphoric acid, 320.6 lbs., at 6 cents	19 23
Total value	$42 93

No. of Analysis—10.
Name of Fertilizer—Bone Dust and Ammoniated Bone Guano.
Manfacturer—Chas. E. Hall, Indianapolis, Ind.

Per cent. of moisture	9.24
Per cent. of insoluble phosphoric acid	14.53
Per cent. of reverted phosphoric acid	2.57
Total per cent. of phosphoric acid	17.10
Per cent. of ammonia	5.01

ESTIMATED VALUE PER TON.

Ammonia, 100.2 lbs., at 17½ cents	$17 53
Soluble and reverted phosphoric acid, 51.4 lbs., at 10 cents	5 14
Insoluble phosphoric acid, 290.6 lbs., at 6 cents	17 43
Total value	$40 10

No. of Analysis—11.
Name of Fertilizer—Banner Bone Meal.
Manufacturer—Chas. E. Hall, Indianapolis, Indiana.

Per cent. of moisture	6.25
Per cent. of insoluble phosphoric acid	7.30
Total per cent. of phosphoric acid	7.30
Per cent. of ammonia	5.10

ESTIMATED VALUE PER TON.

Ammonia, 102 lbs., at 17½ cents	$17 85
Insoluble phosphoric acid, 146 lbs., at 6 cents	8 76
Total value	$26 61

No. of Analysis—12.
Name of Fertilizer—Champion Phosphate.
Manufacturer—E. Rauh & Son, Indianapolis, Indiana.

Per cent. of moisture	8.09
Per cent. of soluble phosphoric acid	0.79
Per cent. of insoluble phosphoric acid	10.86
Per cent. of reverted phosphoric acid.	2.85
Total per cent. of phosphoric acid	14.50
Per cent. of ammonia.	4.48
Per cent. of potassium oxide	1.64

ESTIMATED VALUE PER TON.

Ammonia, 89.6 lbs., at 17½ cents	$15 68
Soluble and reverted phosphoric acid, 72.8 lbs., at 10 cents	7 28

Insoluble phosphoric acid, 217.2 lbs., at 6 cents	13 03
Potassium oxide, 32.8 lbs., at 6 cents	1 97
Total value	$37 96

No. of Analysis—13.
Name of Fertilizer—Raw Bone Meal.
Manufacturer—E. Rauh & Son, Indianapolis Ind.

Per cent. of moisture	7.30
Per cent. of insoluble phosphoric acid	26.04
Per cent. of reverted phosphoric acid	1.45
Total per cent. of phosphoric acid	27.49
Per cent. of ammonia	3.95

ESTIMATED VALUE PER TON.

Ammonia, 79 lbs., at 17½ cents	$13 82
Soluble and reverted phosphoric acid, 29 lbs., at 10 cents	2 90
Insoluble phosphoric acid, 520.8 lbs., at 6 cents	31 25
Total value	$47 97

No. of Analysis—14.
Name of Fertilizer—Steam Bone Meal.
Manufacturer—E. Rauh & Son, Indianapolis, Ind.

Per cent. of moisture	3.35
Per cent. of insoluble phosphoric acid	23.81
Per cent. of reverted phosphoric acid	2.02
Total per cent. of phosphoric acid	25.83
Per cent. of ammonia	2.75

ESTIMATED VALUE PER TON.

Ammonia, 55 lbs., at 17½ cents	$ 9 62
Soluble and reverted phosphoric acid, 40.4 lbs., at 10 cents	4 04
Insoluble phosphoric acid, 476.2 lbs., at 6 cents	28 57
Total value	$42 23

No. of Analysis—15.
Name of Fertilizer—Fertilizer.
Manufacturer—E. Rauh & Son, Indianapolis, Ind.

Per cent. of moisture	2.44
Per cent. of insoluble phosphoric acid	14.81
Per cent. of reverted phosphoric acid	0.93

Total per cent. of phosphoric acid	15.74
Per cent. of ammonia	4.91

ESTIMATED VALUE PER TON.

Ammonia, 98.2 lbs., at 17½ cents	$17 18
Soluble and reverted phosphoric acid, 18.6 lbs., at 10 cents	1 86
Insoluble phosphoric acid, 296.2 lbs., at 6 cents	17 77
Total value	$36 81

No. of Analysis—16.
Name of Fertilizer—Azotine.
Manufacturer—E. Rauh & Son, Indianapolis, Ind.

Per cent. of ammonia	14.65

ESTIMATED VALUE PER TON.

Ammonia, 293 lbs., at 17½ cents	$51 27
Total value	$51 27

No. of Analysis—19.
Name of Fertilizer—Raw Bone Super-phosphate of Lime.
Manufacturer—Geo. E. Currie & Co., Cincinnati, Ohio.

Per cent. of moisture	9.22
Per cent. of soluble phosphoric acid	.88
Per cent. of insoluble phosphoric acid	15.63
Per cent. of reverted phosphoric acid	3.54
Total per cent. of phosphoric acid	20.05
Per cent. of ammonia	4.86

ESTIMATED VALUE PER TON.

Ammonia, 97.2 lbs., at 17½ cents	$17 01
Soluble and reverted phosphoric acid, 88.4 lbs., at 10 cents	8 84
Insoluble phosphoric acid, 312.6 lbs., at 6 cents	18 75
Total value	$44 60

No. of Analysis—20.
Name of Fertilizer—Flour of Bone.
Manufacturer—Geo. E. Currie & Co., Cincinnati, Ohio.

Per cent. of moisture	5.74
Per cent. of insoluble phosphoric acid	27.26

Per cent. of reverted phosphoric acid	1.15
Total per cent. of phosphoric acid	28.41
Per cent. of ammonia	2.33

ESTIMATED VALUE PER TON.

Ammonia, 46.6 lbs., at 17½ cents	$ 8 15
Soluble and reverted phosphoric acid, 23 lbs., at 10 cents	2 30
Insoluble phosphoric acid, 545.2 lbs., at 6 cents	32 71
Total value	$43 16

No. of Analysis—21.
Name of Fertilizer—Raw Bone Meal.
Manufacturer—Geo. E. Currie & Co., Cincinnati, Ohio.

Per cent. of moisture,	7.77
Per cent. of insoluble phosphoric acid	19.78
Per cent. of reverted phosphoric acid	1.68
Total per cent. of phosphoric acid	21 46
Per cent. of Ammonia	4.01

ESTIMATED VALUE PER TON.

Ammonia, 80.2 lbs., at 17½ cents	$14 03
Soluble and reverted phosphoric acid, 33.6 lbs., at 10 cents	3 36
Insoluble phosphoric acid, 395.6 lbs., at 6 cents	23 73
Total value	$41 12

No. of Analysis—22.
Name of Fertilizer—Fine Raw Bone.
Manufacturer—Northwestern Fertilizing Company, Chicago, Ill.

Per cent. of moisture	7.00
Per cent. of insoluble phosphoric acid	21.39
Per cent. of reverted phosphoric acid	1.85
Total per cent. of phosphoric acid	23.24
Per cent. of ammonia	4.32

ESTIMATED VALUE PER TON.

Ammonia, 86.4 lbs., at 17½ cents	$15 12
Soluble and reverted phosphoric acid, 37.0 lbs., at 10 cents	3 70
Insoluble phosphoric acid, 427.8 lbs., at 6 cents	25 66
Total value	$44 48

No. of Analysis—23.
Name of Fertilizer—National Bone Dust.
Manufacturer—Northwestern Fertilizing Company, Chicago, Ill.

Per cent. of moisture	17.78
Per cent. of soluble phosphoric acid	4.89
Per cent. of insoluble phosphoric acid	5.05
Per cent. of reverted phosphoric acid	0.78
Total per cent. of phosphoric acid	10.72
Per cent. of ammonia	2.70

ESTIMATED VALUE PER TON.

Ammonia, 54 lbs., at 17½ cents	$ 9 45
Soluble and reverted phosphoric acid, 113.4 lbs., at 10 cents	11 34
Insoluble phosphoric acid, 101 lbs., at 6 cents	6 06
Total value	$26 85

No. of Analysis—24.
Name of Fertilizer—Garden City Super-phosphate.
Manufacturer—North Western Fertilizing Co., Chicago, Ill.

Per cent. of moisture	17.55
Per cent. of soluble phosphoric acid	5.66
Per cent. of insoluble phosphoric acid	4.57
Per cent. of reverted phosphoric acid	0.32
Total per cent. of phosphoric acid	10.55
Per cent. of ammonia	1.90
Per cent. of potassium oxide	1.51

ESTIMATED VALUE PER TON.

Ammonia, 38 lbs., at 17½ cents	$ 6 65
Soluble and reverted phosphoric acid, 119.6 lbs., at 10 cents	11 96
Insoluble phosphoric acid, 91.4 lbs., at 6 cents	5 48
Potassium oxide, 30.2 lbs., at 6 cents	1 81
Total value	$25 90

No. of Analysis—25.
Name of Fertilizer—Super-phosphate of Lime.
Manufacturer—Geo. E. Currie & Co., Louisville, Ky.

Per cent. of moisture	13.41
Per cent. of soluble phosphoric acid	4.95
Per cent. of insoluble phosphoric acid	10.06
Total per cent. of phosphoric acid	15.01

Per cent. of ammonia	2.48
Per cent. of potassium oxide	1.29

ESTIMATED VALUE PER TON.

Ammonia, 49.6 lbs., at 17½ cents	$8 68
Soluble and reverted phosphoric acid, 99 lbs., at 10 cents	9 90
Insoluble phosphoric acid, 201.2 lbs., at 6 cents	12 07
Potassium oxide, 25.8 lbs., at 6 cents	1 54
Total value	$32 19

No. of Analysis—26.
Name of Fertilizer—Raw Bone Meal.
Manufacturer—George E. Currie & Co., Louisville, Ky.

Per cent. of moisture	9.41
Per cent. of insoluble phosphoric acid	20.13
Per cent. of reverted phosphoric acid	5.55
Total per cent. of phosphoric acid	25.68
Per cent. of Ammonia	5.10

ESTIMATED VALUE PER TON.

Ammonia, 102 lbs., at 17½ cents	$17 85
Soluble and reverted phosphoric acid, 111 lbs., at 10 cents	11 10
Insoluble phosphoric acid, 402.6 lbs., at 6 cents	24 15
Total value	$53 10

No. of Analysis—27.
Name of Fertilizer—Ammoniated Bone Super-phosphate.
Manufacturer—L. L. Crocker, Buffalo, N. Y.

Per cent. of moisture	13.86
Per cent. of soluble phosphoric acid	2.33
Per cent. of insoluble phosphoric acid	7.19
Per cent. of reverted phosphoric acid	2.87
Per cent. of ammonia	3.57
Per cent. of potassium oxide	[*]1.13

ESTIMATED VALUE PER TON.

Ammonia, 71.4 lbs., at 17½ cents	$12 49
Soluble and reverted phosphoric acid. 104 lbs., at 10 cents	10 40
Insoluble phosphoric acid, 143.8 lbs., at 6 cents	8 62
Potassium oxide, 22.6 lbs., at 6 cents	1 35
Total value	$32 86

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[*] Printed 2.17 on labels by mistake.

Number of Analysis—28.
Name of Fertilizer—"Restorer" Ammoniated Bone Super-phosphate.
Manufacturer—Henry Kraus & Co., St. Louis, Mo.

Per cent. of moisture	11.98
Per cent. of soluble phosphoric acid	2.46
Per cent. of insoluble phosphoric acid	10.94
Per cent. of reverted phosphoric acid	2.34
Total per cent. of phosphoric acid	15.74
Per cent. of ammonia	3.23

ESTIMATED VALUE PER TON.

Ammonia, 64.6 lbs., at 17½ cents	$11	30
Soluble and reverted phosphoric acid, 96 lbs., at 10 cents	9	60
Insoluble phosphoric acid, 218.8 lbs., at 6 cents	13	12
Total value	$34	02

No. of Analysis—29.
Name of Fertilizer—Ammoniated Super-phosphate.
Manufacturer—Amor Smith & Co., Cincinnati, O.

Per cent. of moisture	7.06
Per cent. of soluble phosphoric acid	4.12
Per cent. of insoluble phosphoric acid	14.38
Per cent. of reverted phosphoric acid	2.14
Total per cent. of phosphoric acid	20.64
Per cent. of ammonia	3.24

ESTIMATED VALUE PER TON.

Ammonia, 64.8 lbs., at 17½ cents	$11	34
Soluble and reverted phosphoric acid, 125.2 lbs., at 10 cents	12	52
Insoluble phosphoric acid, 287.6 lbs., at 6 cents	17	25
Total value	$41	11

No. of Analysis—30.
Name of Fertilizer—Ammoniated Bone Meal.
Manufacturer—Amor Smith & Co., Cincinnati, O.

Per cent. of moisture	6.77
Per cent. of insoluble phosphoric acid	20.76
Total per cent. of phosphoric acid	20.76
Per cent. of ammonia	4.08

ESTIMATED VALUE PER TON.

Ammonia, 81.6 lbs., at 17½ cents	$14 28
Insoluble phosphoric acid, 415.2 lbs., at 6 cents	24 91
Total value	$39 19

No. of Analysis—31.
Name of Fertilizer—"Restorer" Ammoniated Bone Super-phosphite.
Manufacturer—Henry Kraus & Co., St. Louis, Mo.

Per cent. of moisture	16.70
Per cent. of soluble phosphoric acid	2.87
Per cent. of insoluble phosphoric acid	8.31
Per cent. of reverted phosphoric acid.	3.85
Total per cent. of phosphoric acid	15.03
Per cent. of ammonia.	2.70

ESTIMATED VALUE PER TON.

Ammonia, 54 lbs., at 17½ cents.	$9 45
Soluble and reverted phosphoric acid, 134.4 lbs., at 10 cents	13 44
Insoluble phosphoric acid, 166.2 lbs., at 6 cents	9 97
Total value	$32 86

No. of Anaylsis—32.
Name of Fertilizer—Ammoniated Raw Bone Super-phosphate.
Manufacurer—Thompson & Edwards, Chicago, Ill.

Per cent. of moisture	4.65
Per cent. of soluble phosphoric acid	7.33
Per cent. of insoluble phosphoric acid	5.72
Per cent. of reverted phosphoric acid	0.79
Total per cent. of phosphoric acid	13.84
Per cent. of ammonia.	2.78

ESTIMATED VALUE PER TON.

Ammonia, 55.6 lbs., at 17½ cents	$9 73
Soluble and reverted phosphoric acid, 162.4 lbs., at 10 cents.	16 24
Insoluble phosphoric acid, 114.4 lbs., at 6 cents	6 86
Total value	$32 83

No. of Analysis—34.
Name of Fertilizer—Kansas Bone Meal.
Manufacturer—Thompson & Edwards, Chicago, Ill.

Per cent. of moisture	7.30
Per cent. of soluble phosphoric acid	3.08
Per cent. of insoluble phosphoric acid	14.18
Per cent. of reverted phosphoric acid	1.07
Total per cent. of phosphoric acid	18.33
Per cent. of ammonia	2.04

ESTIMATED VALUE PER TON.

Ammonia, 40.8 lbs., at 17½ cents	$7 14
Soluble and reverted phosphoric acid, 83 lbs., at 10 cents	8 30
Insoluble phosphoric acid, 283.6 lbs., at 6 cents	17 01
Total value	$32 45

No. of Analysis—33.
Name of Fertilizer—Dissolved Bone Meal.
Manufacturer—Thompson & Edwards, Chicago, Ill.

Per cent. of moisture	7.39
Per cent. of soluble phosphoric acid	3.56
Per cent. of insoluble phosphoric acid	14.56
Per cent. of reverted phosphoric acid	0.79
Total per cent. of phosphoric acid	18.91
Per cent. of ammonia	2.08

ESTIMATED VALUE PER TON.

Ammonia, 41.6 lbs., at 17½ cents	$7 28
Soluble and reverted phosphoric acid, 87 lbs., at 10 cents	8 70
Insoluble phosphoric acid, 291.2 lbs., at 6 cents	17 47
Total value	$33 45

No. of Analysis—35.
Name of Fertilizer—Ammoniated Dissolved Bone.
Manufacturer—Northwestern Fertilizing Company, Chicago, Ill.

Per cent. of moisture	21.32
Per cent. of soluble phosphoric acid	5.22
Per cent. of insoluble phosphoric acid	3.25
Per cent. of reverted phosphoric acid	0.46
Total per cent. of phosphoric acid	8.93
Per cent. of ammonia	2.35
Per cent. of potassium oxide	1.64

ESTIMATED VALUE PER TON.

Ammonia, 47 lbs., at 17½ cents	$8 22
Soluble and reverted phosphoric acid, 113.6 lbs., at 10 cents	11 36
Insoluble phosphoric acid, 65 lbs., at 6 cents	3 90
Potassium oxide, 32.8 lbs., at 6 cents	1 96
Total value	$25 44

No. of Analysis—36.
Name of Fertilizer—Garden City Super-phosphate.
Manufacturer—Northwestern Fertilizing Company, Chicago, Ill.

Per cent. of moisture	19.59
Per cent. of soluble phosphoric acid	6.11
Per cent. of insoluble phosphoric acid	4.67
Total per cent. of phosphoric acid	10.78
Per cent. of ammonia	2.93
Per cent. of potassium oxide	1.52

ESTIMATED VALUE PER TON.

Ammonia, 58.6 lbs., at 17½ cents	$10 25
Soluble and reverted phosphoric acid, 122.2 lbs., at 10 cents	12 22
Insoluble phosphoric acid, 93.4 lbs., at 6 cents	5 60
Potassium oxide, 30.4 lbs., at 6 cents	1 82
Total value	$29 89

No. of Analysis—37.
Name of Fertilizer—Bone Meal.
Manufacturer—Henry Kraus & Co., St. Louis, Mo.

Per cent. of moisture	5.13
Per cent. of insoluble phosphoric acid	19.77
Per cent. of reverted phosphoric acid	.73
Total per cent. of phosphoric acid	20.50
Per cent. of ammonia	4.33

ESTIMATED VALUE PER TON.

Ammonia, 86.6 lbs., at 17½ cents,	$15 15
Soluble and reverted phosphoric acid, 1.46 lbs., at 10 cents	14
Insoluble phosphoric acid, 395.4 lbs., at 6 cents	23 72
Total value	$39 01

No. of Analysis—38.
Name of Fertilizer—Ammoniated Bone Super-phosphate.
Manufacturer—L. L. Crocker, Buffalo, N. Y.

Per cent. of moisture	13.86
Per cent. of soluble phosphoric acid	3.86
Per cent. of insoluble phosphoric acid	6.24
Per cent. of reverted phosphoric acid	2.10
Total per cent. of phosphoric acid	12.20
Per cent. of ammonia	3.40
Per cent. of potassium oxide	1.23

ESTIMATED VALUE PER TON.

Ammonia, 68 lbs., at 17½ cents	$11 90
Soluble and reverted phosphoric acid, 119.2 lbs., at 10 cents	11 92
Insoluble phosphoric acid, 124.8 lbs., at 6 cents	7 48
Potassium oxide, 24.6 lbs., at 6 cents	1 47
Total value	$32 77

TABULATED ANALYS

Station Number.	NAME OF FERTILIZER.	NAME AND ADDRESS OF MANUFACTURER.	INGRE	
			Moisture.	Soluable Phosphoric Acid.
1	Garden City Super-phosphate	N'western Fertilizing Co., Chicago	16.16	7.08
2	Challenge Corn Grower	N'western Fertilizing Co., Chicago	15.33	6.72
3	Fine Raw Bone	N'western Fertilizing Co., Chicago	10.10	. .
4	National Bone Dust	N'western Fertilizing Co., Chicago	16.59	4.87
5	Bone Meal	Peter Henderson, New York City.	4.65	. .
6	Blood and Bone Fertilizer	Peter Henderson, New York City.	11.21	.71
7	Guano?	Peter Henderson, New York City.	8.49	5.32
8	Fertilizer from refuse of slaughter houses	Chas. E. Hall, Indianapolis	3.95	. .
9	Ground Bone	Chas. E. Hall, Indianapolis	3.58	. .
10	Bone Dust and Ammoniated Bone Guano	Chas. E. Hall, Indianapolis	9 24	. .
11	Banner Bone Meal	Chas. E. Hall, Indianapolis	6.25	‡
12	Champion Phosphate	E. Rauh & Son, Indianapolis	8.09	.79
13	Raw Bone Meal	E. Rauh & Son, Indianapolis	7.30	. .
14	Steam Bone Meal	E. Rauh & Son, Indianapolis	3.35	. .
15	Fertilizer	E. Rauh & Son, Indianapolis	2.44	. .
16	Azotine	E. Rauh & Son, Indianapolis	. .	. .
17	*Land Plaster	From Michigan	20.81	76.65
18	*Land Plaster	From New York	22.48	71.79
19	Raw Bone Super-phosphate of Lime	Geo. E. Currie & Co., Cincinnati	9.22	.88
20	Flour of Bone	Geo. E. Currie & Co., Cincinnati	5.74	. .
21	Raw Bone Meal	Geo. E. Currie & Co., Cincinnati	7.77	. .
22	Fine Raw Bone	N'western Fertilizing Co., Chicago	7.00	. .
23	National Bone Dust	N'western Fertilizing Co., Chicago	17.78	4.89
24	Garden City Super-phosphate	N'western Fertilizing Co., Chicago	17.55	5.66
25	Super-phosphate of Lime	Geo. E. Currie & Co., Louisville	13.41	4.95
26	Raw Bone Meal	Geo. E. Currie & Co., Louisville	9.41	. .
27	Ammoniated Bone Super-phosphate	L. L. Crocker, Buffalo	13.86	2.33
28	Restorer Ammoniated Bone Super-phos	Henry Kraus & Co., St. Louis	11.98	2.46
29	Ammoniated Super-phosphate	Amor, Smith & Co., Cincinnati	7.06	4.12
30	Ammoniated Bone Meal	Amor, Smith & Co., Cincinnati	6.77	. .
31	Restorer Ammoniated Bone Super-phos	Henry Kraus & Co., St. Louis	16.70	2.87
32	Ammoniated Raw Bone Super-phosphate	Thompson & Edwards, Chicago	4.65	7.33
33	Dissolved Bone Meal	Thompson & Edwards, Chicago	7.39	3.56
34	Kansas Bone Meal	Thompson & Edwards, Chicago	7.30	3.08
35	Ammoniated Dissolved Bone	N'western Fertilizing Co., Chicago	21.32	5.22
36	Garden City Super-phosphate	N'western Fertilizing Co., Chicago	19.59	6.11
37	Bone Meal	Henry Kraus & Co., St. Louis	5.13	. .
38	Ammoniated Bone Super-phosphate	L. L. Crocker, Buffalo	13.86	3.86

**Land Plasters;* analysis not required by law. Analyzed for experiments on College farm.

‡ Trace.

ES OF FERTILIZERS.

DIENTS—PER CENT.				Pounds Soluble Phosphoric Acid per ton.	Value of Soluble Phosphoric Acid at ten cents per Pound.	Pounds Insoluble Phosphoric Acid per ton.	Vaule of Insoluble Phosphoric Acid at six cents per Pound.	Pounds Reverted Phosphoric Acid per ton.	Value of Reverted Phosphoric Acid at ten cents per Pound.	Pounds Ammonia per ton.	Value of Ammonia at 17½ cents per Pound.	Pounds Potassium Oxide per ton.	Value of Potassium Oxide at six cents per Pound.	Total Estimated Value per ton.
Insoluble Phosphoric Acid.	Reverted Phosphoric Acid.	Ammonia.	Potassium Oxide.											
3.33	1.29	1.89	1.35	141.6	$14 16	66.6	$4 00	25.8	$2 58	87.8	$6 62	27.0	$1 62	$28 98
1.94	3.05	2.51	1.48	134.4	13 44	38.8	2 33	61.0	6 10	50.2	8 78	29.6	1 77	32 42
21.47	. . .	3.63	. . .	. . .	. . .	429.4	25 76	. . .	. . .	72.6	12 70	. . .	. . .	38 46
2.17	. . .	3.29	. . .	97.4	9 74	43.4	2 60	. . .	. . .	65.8	11 51	. . .	. . .	23 85
15.80	. . .	4.27	. . .	. . .	. . .	31.6	18 96	. . .	. . .	85.4	14 94	. . .	. . .	33 90
4.42	. . .	8.90	1.96	1.42	14	88.4	5 30	. . .	. . .	178.0	31 15	39.2	2 35	38 94
10.62	1.00	6.00	.82	106.4	10 64	212.4	12 74	20.0	2 00	120.0	21 00	16.4	98	47 36
20.42	.84	4.73	. . .	. . .	. . .	408.4	24 50	16.8	1 68	94.6	16 55	. . .	. . .	42 73
16.03	4.10	4.43	. . .	. . .	. . .	320.6	19 23	82.0	8 20	88.6	15 50	. . .	. . .	42 93
14.53	2.57	5.01	. . .	. . .	. . .	290.6	17 43	51.4	5 14	100.2	17 53	. . .	. . .	40 10
7.30	. . .	5.10	‡	. . .	. . .	146.0	8 76	. . .	. . .	102.0	17 85	. . .	. . .	26 61
10.86	2.85	4.48	1.64	15.8	1 58	217.2	13 03	57.0	5 70	89.6	15 68	32.8	1 97	37 96
26.04	1.45	3.95	. . .	. . .	. . .	520.8	31 25	29.0	2 90	79.0	13 82	. . .	. . .	47 97
23.81	2.02	2.75	. . .	. . .	. . .	476.2	28 57	40.4	4 04	55.0	9 62	. . .	. . .	42 23
14.81	.93	4.91	. . .	. . .	. . .	296.2	17 77	18.6	1 86	98.2	17 18	. . .	. . .	36 81
. . .	. . .	14.65	. . .	. . .	. . .	. . .	. . .	. . .	. . .	293.0	51 27	. . .	. . .	51 27
.24	2.13	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1.61	4.44	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
15.63	3.54	4.86	. . .	17.6	1 76	312.6	18 75	70.8	7 08	97.2	17 01	. . .	. . .	44 60
27.26	1.15	2.33	. . .	. . .	. . .	545.2	32 71	23.0	2 30	46.6	8 15	. . .	. . .	43 16
19.78	1.68	4.01	. . .	. . .	. . .	395.6	23 73	33.6	3 36	80.2	14 03	. . .	. . .	41 12
21.39	1.85	4.32	. . .	. . .	. . .	427.8	25 66	37.0	3 70	86.4	15 12	. . .	. . .	44 48
5.05	.78	2.70	. . .	97.8	9 78	101.0	6 06	15.6	1 56	54.0	9 45	. . .	. . .	26 85
4.57	.32	1.90	1.51	113.2	11 32	91.4	5 48	6.4	64	38.0	6 65	30.2	1 81	25 90
10.06	. . .	2.48	1.29	99.0	9 90	201.2	12 07	. . .	. . .	49.6	8 68	25.8	1 54	32 19
20.13	5.55	5.10	. . .	. . .	. . .	402.6	24 15	111.0	11 10	102.0	17 85	. . .	. . .	53 10
7.19	2.87	3.57	†1.13	46.6	4 66	143.8	8 62	57.4	5 74	71.4	12 49	22.6	1 35	32 86
10.94	2.34	3.23	. . .	49.2	4 92	218.8	13 12	46.8	4 68	64.6	11 30	. . .	. . .	34 02
14.38	2.14	3.24	. . .	82.4	8 24	287.6	17 25	42.8	4 28	64.8	11 34	. . .	. . .	41 11
20.76	. . .	4.08	. . .	. . .	. . .	415.2	24 91	. . .	. . .	81.6	14 28	. . .	. . .	39 19
8.31	3.85	2.70	. . .	57.4	5 74	166.2	9 97	77.0	7 70	54.0	9 45	. . .	. . .	32 86
5.72	.79	2.78	. . .	146.6	14 66	114.4	6 86	15.8	1 58	55.6	9 73	. . .	. . .	32 83
14.56	.79	2.08	. . .	71.2	7 12	291.2	17 47	15.8	1 58	41.6	7 28	. . .	. . .	33 45
14.18	1.07	2.04	. . .	61.6	6 16	283.6	17 01	21.4	2 14	40.8	7 14	. . .	. . .	32 45
3.25	.46	2.35	1.64	104.4	10 44	65.0	3 90	9.2	92	47.0	8 22	32.8	1 96	25 44
4.67	. . .	2.93	1.52	122.2	12 22	93.4	5 60	. . .	. . .	58.6	10 23	30.4	1 82	29 89
19.77	.73	4.33	. . .	. . .	. . .	395.4	23 32	14.6	14	86.6	15 15	. . .	. . .	39 01
6.24	2.10	3.40	1.23	77.2	7 72	124.8	7 48	42.0	4 20	68.0	11 90	24.6	1 47	32 79

†By mistake printed on lable 2.17.

‡ Trace.

OUR AGRICULTURAL COLLEGE WORK.*

BY PROF. C. L. INGERSOLL, OF PURDUE UNIVERSITY.

This matter of agricultural work is one in which I am closely engaged. Agricultural Colleges, or Industrial Schools are of somewhat recent origin. Other kinds of education have in their favor the prestige of being ancient. Just before the beginning of this century the first school of industrial education was established. This was situated in Switzerland, and it is rather remarkable that the first school for teaching of agricultural science should originate in a little free republic like that. The idea of agricultural colleges developed quite rapidly in Europe. We find the establishment of a school of this kind as early as 1803, and another in 1806. In France there was one established in 1821. In 1827 one in Ireland, and in 1849, one in England. I give a few of those dates to show how rapidly they increased, but those countries which had no backbone, either political or commercial were not sufficiently zealous to start an agricultural school. About this time their influence was being felt across the Atlantic in America; Michigan being the first to esteem the wisdom of an agricultural college. At the establishment of their agricultural society, a few men gathered together, having received a charter from the Legislature to hold fairs, they saw the necessity of having an agricultural college, and in 1850 the Legislature took some action on the subject, but the school was not started until 1857, and is now only a quarter of a century old. This is perhaps one of two schools in the United States which is purely agricultural. Mississippi has started a similar one, and teaches the same branches.

Congress, in 1862, gave thirty thousand acres of land to the several States and Territories for the establishment of universities for instruction in agriculture and mechanic arts, and it is under this grant that Purdue University is established. In Canada we find they have looked up this matter pretty thoroughly, and started a school after visiting all the schools in the United States. They teach geology, practical and analytical chemistry, systematic botany, zoology and anatomy. This implies what agricultural colleges should teach. The schools in England are for the aristocrats of the land, and pupils are not taught to take hold and do the work that every one needs, but the Americans are teaching by practical work as well as by theory.

In my travels over the country I am frequently asked, Where are you located? I tell them that I am located at Purdue University, and was formerly from Michigan. Then they want to know what we teach in those colleges. I say to them that we teach chemistry, botany, history, etc., and practical agriculture, as it takes place in our fields. At Purdue University we have three courses of study, that is, scientific, agricultural and mechanical, which are similar, though in the main a little different. In the agricultural course the first term the student listens to a course of lectures upon stock, breeds of horses, cattle, sheep and swine, and if time is allowed he gives some accurate experiments in agriculture. We then have talks on stock breeding, same on comparative anatomy, veterinary obstetrics and botany, and give some experiments in entymology, which closes the work of the first year. The second year the student takes up the work of horticulture and floriculture. The different kinds of flowers are studied by actual investigations; landscape gardening and forestry are also taught. Some lectures are given on market gardening and the management of hot beds. Then comes the subject of drainage, which I consider one of the most important questions which comes before the farmers of this State. The third year veterinary science is taken up, and lessons on veterinary medicine given to animal uses are required. We use as a foundation for the most of the work on veterinary science, works that are as free from technicalities as possible. This is followed by lectures on farm management, and during the spring term they get some lectures about agricultural chemistry. We hope to add in the future more of this in the senior year, and give the student some practical work in the line of agricultural chemistry, so that the young man who completes a course at the University would be able to give you a theory on agricultural work, and be able to point out and analyze the different kinds of soil. About the same time he takes up biology or the low order of plant life. This is followed by a course in botany, which occupies two terms, then zoology, physics and the construction of machinery. Two hours are given every day in chemistry, one hour in recitation to the Professor, and one hour with the instruments. He then takes up analytical geometry, and also astronomy; this is only studied three or four weeks. One year is devoted to drawing, he is required to study history; this is followed by the English and German languages, which is about the extent of studies for the agricultural student in the University.

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* Stenographic synopsis of an address before the Annual Agricultural Convention, January, 1882.

Then we have Physiology from which we study the building up and breaking down of the animal tissues in the body. This is followed by a term in Geology which gives you a pretty fair outline of our course of study. Students are required to work a certain number of days when the work can be furnished them without loss to the Institution. If we wish to transplant trees or any kind of outdoor work to be done, the students are the ones we ask to do it. As they are working they are asking questions in regard to the work, and are much benefited in that way. In the winter we have no outdoor work, and the student goes into the mechanical department and takes lessons there. The Professor tells them how to file saws and gives them instruction in carpentry and wood turning, this is one winter's work.

The second winter he learns blacksmithing and the art of using a forge—in dustries which are indispensable in a farming community, as much time may be saved by having a little forge in some corner, and understanding how to use it, of course we do not expect to make practical blacksmiths. Many of you seen the samples at the State Fair last fall and know something of the material exhibited there. The work shows for itself and what it is. We have not had time to develop much in Horticulture and Forestry yet; it is a thing that Universities are not able to do in a day. We shall however endeaver to teach the processes of grafting and the transformation of plants. We also have apparatus for Meteorological observations, conforming to the Signal Service of the United States, with this one exception, they take at Washington mean time, while we take at 9 A. M., 2 P. M., and sundown. Students are taught how to make these observations and how to manage the instruments and their construction.

Just before leaving home I received a report from the Iowa Agricultural College. This is one of the colleges of the West which has built up rapidly, almost within the last 11 years, and is perhaps one of the most successful Western Colleges. In its workings it does not differ materially from ours. Purdue was the first Agricultural College in which students were required to do some work in the mechanics' shop—work that would bring out the latent powers and better him for the farm. Wisconsin has applied this to their University, and Kansas is looking in the same direction. And in the late report from the Michigan Agricultural College they are looking towards having mechanics introduced in their Institution, so that the principles of carpentry may be thoroughly taught.

INDIANA INDUCEMENTS TO IMMIGRANTS.*

BY DR. A. C. STEVENSON.

If I should per chance find anything to say of interest to foreign immigrants I trust it will be equally so to those of our own neighboring states who may find it their interest to make a home here, and I trust our people—the citizens of this State—may be somewhat benefited in reviewing their own advantages.

It will be seen that the State holds a central position with the eastern and middle states, together with the great commercial cities of the Atlantic, and the coal, iron and oil regions of Pennsylvania and West Virginia on the east. On its west lies the great grain and meat producing States, together with the mining States and Territories. On its south lies the cotton, sugar and rice producing States. For the benefit of strangers, I will copy the exact boundaries of the State.

"Indiana, one of the central States of the American Union, lies between 37°, 47′ and 41°, 50′ north latitude, and 84°, 49′ and 88°, 2′ west longitude. It is bounded on the east by the State of Ohio, from which it is seperated by a line drawn due north from the mouth of the great Miami river. On the south by the Ohio river, separating it from Kentucky, between the mouths of the great Miami and the Wabash. On the west by Illinois, from which it is separated by the Wabash river from its mouth to a point where a line drawn due north from Vincennes last touches the western bank of that stream; thence north on that line to a point ten miles north of the southern extremity of Lake Michigan. On the north by a line drawn from that point due east, until it intersects the eastern boundary, separating the State from Michigan. A small portion of Lake Michigan is included in the northern boundary. The coast line is about 60 miles in length. Michigan City is the only lake harbour in the State. The extreme length of the State is 276 miles, with an average breadth of 145 miles, and the area is 33,809 square miles."

The State has no mountains, and only a few hills along its southern border worth a notice. The State occupies a table land, with a gentle inclination southward, with the exception of a small portion along the northern border, which is drained into the lakes. The soil is a rich loam resting upon a clay subsoil. A dense forest once overshadowed a carpet of wild grasses beneath. I well remember how I was enchanted with the beauty and richness of the country as I traveled over it sixty years ago, along narrow pathways frequently crossed by small streams and rivers as clear as glass, in which could be seen its finny inhabitants in a depth of water of ten feet. It will be seen and noted by immigrants that the State lies immediately in the latitude known as the grass region, where the best cultivated grasses flourish, unharmed by the extreme heat of the summer's sun, or the extreme freezing of northern winters, where horses, cattle and sheep can be raised without the plow. The soil of the State is very productive and not easily exhausted, even the clay subsoil beneath when exposed for a season becomes very productive. The products of the State are corn, wheat, rye, oats, barley, sorghum, hay, potatoes, cabbage, beets, parsnips, and still other garden vegetables too numerous to mention. Fruits: Apples, pears, quince, raspberries, blackberries, strawberries, goosberries, and currants, and peaches in special localities.

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* Delivered before Annual Agricultural Convention, January, 1882.

Domestic animals: Horses, mules, cattle, sheep and hogs. Fowls: Turkeys, pea-fowls, guinea-fowls, barn-yard fowls or the common hen and pigeons. In considering our products of corn and wheat, of cattle, horses, sheep, hogs, fruits, vegetables and fowls, the great advantages of a central position is at once apparent. The great grain and wheat producing States is west of us, and further from our large eastern cities and commercial ports, and manufacturing districts, which constitutes at least a very important part of our market for these products. They are compelled necessarily to pass through this State. Longer lines of travel implies greater costs of transportation and greater risks and damage to live stock. We invite that intelligent flood of agriculturists from our eastern States as they pass westward, to consider these advantages; but this is but a very slight view of the advantages of a central location. It should not be overlooked that our whole southern border is separated only by a very short distance, from the cotton, sugar and rice producing States, and that they are large consumers of our products, and we are of theirs. This consumption will increase from year to year. The South has commenced a new era in her life, and her history and wealth. Her agricultural system is rapidly changing and improving. New ideas have taken hold of her as is manifest in the great exhibition now being held in Atlanta, Georgia. The North will here learn many things of the South, and the South many things of the North, alike beneficial to both. And not the least many old predjudices will be done away with, and many new loves and attachments formed, binding the Nation together with strong ties of affection and love and a common interest. The South will continue to purchase flour, meal, bacon, butter, cheese, horses and mules of the West, simply because they can make them at less cost by raising cotton and sugar; and as surely will the North buy cotton, sugar and rice of the South. Climatical causes—nature's laws—controls in this. Our central advantages here presents themselves again. First, our contiguity; second, our water communication by the Ohio river and the Mississippi through the very center of the cotton States; and lastly, by a number of railroads at several different points.

With the outside world the State holds quite an enviable position. North, she has water communication by the lakes, the Welland canal and the St. Lawrence, with the gulf of St. Lawrence; east, the great commercial cities of the Atlantic is reached by the lakes and the New York canal and numerous railroads; south, the Gulf of Mexico is reached by water through the Ohio and Mississippi rivers; west, by rail the mining States, and Territories, and Pacific ports are reached.

There are in the older States a great many young men of good industrious habits, fair education, good morals, and willing to work, who are seeking employment. In addition to these are a great many foreign immigrants of good morals and industrious habits seeking the same thing. What I have already said has been for those supposed to possess means to make purchases of such realty as may be needed to make them producers of marketable products on their own account, but to such as have not, let me remind that there is in the State 21,637,760 acres of land, the most of which is arable. The population 2,000,000. One-half of this number is women, deduct next the children, old persons and invalids, miners, manufacturers, mechanics, the citizens of the cities and towns and vilages, civil officers, teachers and ministers, and there will be left quite an insufficient force to work these 21,000,000 of acres. Help is needed by almost every farmer for which he is willing to pay from seventy-five cents to a dollar per day and board, and if he has a family a house is generally furnished, also a garden, firewood, pasture for his cow and a few pigs, fowls at his pleasure and he boards himself with still some increase in wages. The large coal fields of the State hire large numbers of men. The large quarries of mountain limestone are worked by hired labor. The 5,000 miles of railroad is run and kept in repair by hired labor. In 1878, the value of the State's manufactures was $185,050,220. This was doubtless the product of hired labor. The State in 1880 had ten cities, viz.: Indianapolis, with a population of 75,074; Evansville, 29,280; Fort Wayne, 26,880; Terre Haute, 26,040; New Albany, 16,422; Lafayette, 14,860; South Bend, 13,279; Richmond, 12,473; Logansport, 11,198; Jeffersonville, 10,422. These cities and the very large number of smaller towns require a large number of laborers, clerks and salesmen for which wages, for both male and female, are liberally paid. More might be added but we trust enough has been indicated to show that there is a great opportunity and demand for those who are willing and not ashamed to work, and rich rewards are in store for them. I can name a number of our best and wealthiest farmers who, since I settled in the State, fifty-five years ago, were working by the day and month at small wages. I have immediately in mind in my immediate (former) neighborhood several such, viz.:

Isaac Browning, who is the owner of more than one good farm; the Allys, Hutchinsons, two brothers; Gilam Rains, the son of a widow, worked for years as a hired hand, is the owner now of several fine farms, and is young yet and likely to be the owner of several more. What has been done can be done again.

A similar success has attended the industrious in the towns and cities. Many bankers and merchants and leading mechanics commenced life poor. The cashier and clerk of one of the best managed National Banks in the State I know to have made their own fortunes. In the mercantile line many might be named equally successful. This healthy condition of things may well be encouraging to all beginners.

All that is here seen as encouraging to the agriculturist and the hired laborer is more so to the artizan, the manufacturer, the merchant and the capitalist. Capital as an emigrant, like individuals, is often seen seeking the far west and locating upon government lands, where, instead of making improvements, is content with paying large taxes to the State and grazing the neighboring herds of cattle for nothing for fifteen or twenty years, seeking a purchaser, and at last is forced to take first cost, with the loss of interest and a large sum in taxes. But he has the consolation of having assisted in building a number of school houses and adding largely to the revenues of an infant and worthy young State. This is my experience in a small adventure that I once made in public lands. Many have done even worse, paid a large amount in taxes and then let them go for taxes still accruing. Disappointed in this it has sought other modes. Loans upon realty was thought to be quite safe. But this has not been without risks and many losses. Over valuations have not been infrequent, foreclosures and sales that did not pay the costs of the property held, and rents paying little interest. The traveler that forsakes the well known road to his destination for a nearer route by some obscure pathway, frequently finds himself lost and is compelled to retrace his steps in the darkness of night.

Let manufacturers and capitalists join hands, as they always have done, and engage in business that they well understand, the profits of which they well know, and in proper localities, and there is no danger of success or losses only as is common in all things, where the natural or necessary appliances and the demands for the products are of the requisite character.

We invite a close attention to these things. The manufacturer wants power to run his machinery, easily obtained and cheap, and this can be had here. This State has a number of small rivers crossing it at many points, that may be easily dammed, that will afford ample water power for a very large number of factories and mills. Mill men now seem to prefer steam and are generally using it in preference to water power.

For steam purposes the State has an abundance of good coal. In the southwestern part of the State there are 7,000 square miles of stone coal, of seven working seams, at a depth of from 50 to 220 feet, and of from 2½ to 11 feet in thickness. These mines are in an arable, well settled country, good farms, numerous town and villages, and with several cities, viz: Indianapolis, Terre Haute, Evansville, New Albany, Jeffersonville and Greencastle, in the immediate vicinity, each of which is now doing quite an amount of manufacturing. These coal-fields are approached by a number of first class railroads, leading by short runs to every part of the State and from which all parts of the United States may be reached. These coal-fields are covered by forests of fine timber, and bordered on the east by the most extensive beds of subcarboniferous or mountain limestone, that will be of great value in the construction of factories and dams for water power.

There are other considerations of value, the amount of raw material at hand produced in the State. Timber is found here of many varieties, both hard and soft, suitable for the best buildings and the finest finishing, and for furniture of the finest quality. The manufacturer of the finest furniture need not go beyond the limits of the State for his material. The mechanic and the engineer who must have for bridges, mills and buildings, to support great burdens, the strongest timbers, needs nothing better than our many varieties of oak. Textiles of wool, flax and hemp are abundant, and may be procured abundantly without the cost of distant transportation; and cotton at but a trifling cost. The abundant supply of provisions, meats, flour, meal, fruits and vegetables, are so great and so well known that they scarcely need a mention, yet their value to the manufacturer are of very great importance, insuring profitable dividends.

There is no healthier State in the Union than Indiana. Finer men and handsomer women are not to be found—health and vigor is well marked in every face. Another fact of some importance is that our people are a willing people and are anxious to see our manufactories greatly increased. Manufacturers who may emigrate here will find friends who will be ready to lend aid to enterprises of this kind in every possible way. Our people have got above that low degree of intelligence that enables demagogues to thrive by the cry of "monopoly"—"rich monopolists who grind the poor and are given bounties and special privileges." Such a state of society is exceedingly disagreeable to say the least, and often by ill-advised litigation are very troublesome to the manufacturer.

There is still one thing yet that is indispensable and without which all else amounts to nothing, and that is a good market. Is that to be had here? We answer in the affirmative, yea. The State has now two million of inhabitants, in a healthy business condition, mostly agriculturists, able to buy all needed manufactures which are many and must be had, and if they can not be had at home must be procured abroad. Let us make an invoice of a very ordinary house and household goods of one of our common farmers that we may the better comprehend our wants. And first of all a house must be had, lumber, boards, scantling, shingles. To furnish these a mill must be had to cut the boards, saws are needed for the mill and a machine shop is needed to make them. Lumber must be had, and teams, wagons and axes to get the logs for the mill. Factories must be had before the wagon can move, and the ax, simple as it is can not be had without a factory and a manufacturer. Still more to make the ax iron and steel must be had, these require furnaces to furnish the pig iron. Rolling mills to prepare the ax bars. The steel requires great complicated machinery for its manufacture. And all the hands thus engaged must be fed by the farmer who furnishes the meat, fowls, milk, butter, cheese, fruit, vegetables; and lastly the bread, but this again requires mills and machinery, engines and boilers, and again, these engines require great factories and much machinery and trained workmen to make them. Now we have only the boards and shingles, we are ready for work; but the carpenter must have a hammer and nails, saw, adze, square and ax, each of these must be furnished by a manufacturer. Now we want brick, lime, sand. The mason and plasterer must have trowels, nice steel instruments and manufacturing establishments must be had before the chimney can be put up or mortar can be put in place. Now doors and sash, again we must have a factory; and yet there is glass and glassworks must be had. We have now a plain house not painted even. But we must have something in it—a chair to sit upon and another factory is needed—a table to eat upon, another factory; dishes for the table, and another factory is needed; knives, forks, spoons, and again other factories. Stoves, kettles of tin, iron and copper requiring other factories. Beds, bedding and bedsteads, cabinet factories for the latter; mattress makers and woolen factories for blankets and coverlets, with complicated machinery of cards, jennies, looms, fullers, etc. Now we have only provided for a young family in the plainest and most inexpensive manner. But we can not stop yet. The family must be clothed, woolen and cotton goods at least must be had and these require factories for both wool and cotton. Hats, bonnets and shoes requiring as many factories. Now these young folks are ready for business, the lady wants needles, thread, scissors, a thimble, all requiring as many factories. The gentleman also wants tools to work the farm, plows, hoes, harrows, wagons, forks, harness, requiring as many manufacturies, men and boys work, women and girls—a few may be too young and a few to old, yet there are a large number to be supplied, there being two million in the State.

One other item of no small interest to which we would call the attention is the very large system of railroads completed in the State, the most of which center or conjoin in this city. There are 4,963 miles of road, with several more roads projected, and several near completion. The new lines must have entire new outfits of freight, passenger cars and locomotives. Business is constantly increasing on the old roads, requiring additional cars and locomotives; wear and accident make additional requirements. And it might appropriately be noticed in this place that there is a very large demand for similar machinery to run the great number of grist and saw-mills that are found in every one of our ninety-two counties. Add to these the same kind of machinery for all the different kinds of machine shops and there is a large thing just here for the manufacturers of engines, locomotives, cars, railroad irons of steel and iron, chairs, spikes, etc.

This is but a faint picture of our wants, but my time and your patience will not permit me to pursue this view of our wants further. But I trust it will be worth the consideration of immigrants (of this class) and to capitalists. The permanency and value of investments of this kind is fair; these wants are permanent and must last as long as civilization endures. In view of our central position, our water and rail transportation, placing us in connection with all the other States of the Union. Our manufactures are by no means to be confined to the two million inhabitants of this State. The great grain and meat producing States and the gold and silver mining districts lies west of our State, whilst the manufacturing States lies east of us some hundreds of miles adding greatly to their cost of transportation as against this State. Also an advantage in time in ordering manufactures that will always give a preference to near points over distant ones. Our connections with the south are short runs by rail; and by river at all seasons, except very short periods, and that only occasionally, by ice or drouth. Our manufactures are already going there. Indiana plows, wagons, and carriages may be seen there. Studebaker wagons, of South Bend, may be seen for sale in many of the southern towns. Renic and Curtis carriages are there. I saw there long strings of cheap carriages made in a neighboring city in Ohio (Cincinnati), traveling from town to town as they are seen here. But this is to be a great manufacturing center, of that there can be no doubt. Its central position as to the States of the Union; its rail and water communication; its convenient outlets to other countries; the vast accumulation of capital seeking profitable investment. Every State now has a college for teaching agriculture and the mechanic arts. These young men will readily seize upon the best localities which must make this a great manufacturing State.

Many other considerations press us, such as the advantages of special localities, which would require a lengthy paper of itself, and would undoubtedly be, if well considered, very valuable to the manufacturer seeking a locality, but must be passed, to notice very briefly one other thing of greatest interest, and alike beneficial to all classes, the rich and the poor, and all nationalities, and all colors, both white and black, the bulwark of the State and National governments, the source and life of liberty, the mainspring of morals and sound religion, *the State's grand system of education*. In every county, in every township, and these again divided into smaller districts, are to be seen neat, comfortable school houses, of frame or brick, painted bright colors, green grassy yards with neat board fences, and filled with a crowd of healthy, cheerful, rosy cheeked children with books, slates and blackboard receiving instructions by well trained teachers. May it not be justly said that these schools are the pride and glory of the State, when it is known that they are sustained by a fund of nine million two hundred and twenty thousand, seven hundred and eight dollars, and this large amount is being steadily increased.*

A normal school is also provided by the State to train teachers for these common schools. It has also further provided for a college of high order, that education may here be made complete and free to all. But this is not all, the State, mindful that the great sources of wealth is agriculture and the mechanics arts, the one producing food and raw material of great value, the other changing these crude materials into useful articles of many times their value, as they come from the producer of the raw material, has provided amply for these wants by the establishment of a college in which are taught agriculture, the mechanic arts and kindred or necessary sciences. This would seem to be enough, yet Christian benevolence has added largely to these educational sources of the State; as the Presbyterians by a college at Crawfordsville, the Methodists at Greencastle, the Christians at Indianapolis, the Friends at Richmond, and the Presbyterians at Hanover attest. These educational advantages can not be surpassed in the United States. Free as the limpid water that gushes from our hill-sides, from which all may drink without cost, all may as freely drink from these sources of knowledge that are found in every town, village and neighborhood in the State.

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* In 1880 there were 9,647 school-houses, valued at $11,817,954. Not satisfied with all this, the State in the same year provided for $1,519,191 69 by taxation to be added to the interest on the school fund of $204,145.30 adding still interest on non-negotiable bonds $234,187, unclaimed fees $879.22, congressional township revenue $198,247.66, amount of local tuition tax $589,093.21, proceeds of liquor license $193,512.15, making a grand total expended in carrying on the schools for a single year, $2,939,872.23.

IMPORTANCE OF STATISTICS TO AGRICULTURE.*

BY J. B. CONNER, CHIEF OF THE BUREAU OF STATISTICS.

The subject of statistics is usually considered a dry one for discussion. However it may be considered on this occasion, it shall have the merit of brevity. The importance of statistics to agriculture may at first thought seem a narrow subject. But when agriculture is considered in its true relation to the other industries, it will appear much broader. Agriculture in this country stands in its relation to manufacturing, mining and commerce as the balance wheel to the engine which moves the multiform machinery of a great factory. Statistics are collected and classified facts, and though these may relate specifically to the main and counter shafts, pulleys and belts of the great industrial establishment, they have an important relation to the motive and regulating power, but for which all the others would stop their revolutions. Therefore, any adequate exposition of the importance of statistics to agriculture, must take in almost the entire range of the subject of statistics. The briefest outline of so broad a topic must suffice on this ccasion.

The science of statistics had its origin in Europe in the eighteenth century. Prussia, France, Sweden, Belgium and other leading countries of Europe now have well organized departments, searching for facts, comparing and deducing from these new facts, in all departments of activity. The organization of the work in the United States is now going on in almost every State, in one form or another. From the middle of the eighteenth century to this day, classes of men have been shaking their heads and asking the question: "What is the use of statistics, any way?" The simple and plain things require the most time for explanation, and like the lexicographer who takes a page for the definition and interpretation of monosyllables, those who realize the usefulness of statistical science must continue their explanations. But as nothing succeeds like success, the best answer and explanations are statistical tabulations of facts which become as palpable as mathematical solutions.

More than a hundred years ago there was a tract of 500 acres of land, which yielded immense and profitable crops of staple production. The owner of it became wealthy. When he died he left it as the patrimony of an only son. The methods of industry of the father also descended with the farm to the son. But the productions of the farm grew less and less till the son became a subject of neighborly charity. The over-piously inclined friends about him said this was God's providential dealing toward their neighbor, and it was for a wise purpose; that this was the meaning of the failure of his crops, and they comforted him with advice of pious resignation. One day a man came along who had a bent of mind for facts, and who had some love for and knowledge of chemistry. He asked the impoverished farmer how many crops of given kinds had been grown upon his land, and what had been returned to the soil for all this. Putting down the answers and learning that no element had been returned to the soil, he consulted some of the statistical works of a noted Prussian scientist, and found that a given number of crop productions had, in a great many cases cited, exhausted the soil of its potash, or lime, or magnesia, or other elements. He advised the experiment on a small scale with some of these elements added to the soil. It was done and the land produced abundantly again. Resorting to his mine of these elements where all were combined, in his barnyard and other sources of supply, the impoverished farmer soon began to learn that the formula of his over-pious neighbors was not the best solution of his troubles by any means.

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*Delivered before Annual Agricultural Convention, January, 1882.

A hard providence indeed is our ignorance, but if these light afflictions which seem not joyous, but grievous, shall work the peaceable fruits of better thought for those who are exercised thereby, a blessed providence indeed is it after all. That farmer is the type of a million others, all over the world. With such practical solution of his troubles by the man of facts, this one ceased to shake his head or ask, "What is the use of statistics, any way?" Such illustrations stand as an answer in the concrete to the inquiry in the topic under discussion.

It can not always be definitely determined what good may result in the collection and classification of facts, which is the work of statisticians, any more than the judge of a court can tell how a cause may terminate, while the evidence is being heard; but the facts and evidence reveal the true relation of things, and it is found to be wisdom to trust as many facts as we can collect and arrange.

"Of what use is it?" was the question asked in derision when, at the burning of a house, was discovered a piece of glass bent by heat into a convex shape. A man with eyes dimmed by age looked through it and answered, "Much use, indeed," and spectacles resulted. It was thought a small matter when a bar of steel, rubbed against the stones from the magnesian quarries and suspended horizontally assumed a north and south direction, but when a mariner saw it he said: "With this I can steer my ship straight across the Mediterranean sea, whether the clouds obscure the stars or not." So it always is in the discovery of new facts by the classification and manipulation of old ones. We do not know in advance their precise value, but do know that only such States and Nations as avail themselves of every avenue for the collection and classification of facts, make rapid advancement in civilization and material prosperity.

In a further specific view of the subject it may be said that statistical facts enable us to determine approximately the prices in the future, and settle the question whether to hold produce or sell; what kind of crop is most likely to bring most in next year's market; whether to buy supplies now or in the future; to approximate a uniform price of labor; to give us a knowledge of public expenditures, and teach principles of public as well as private economy. In 1879 the farmers of the United States, as statistics show, produced 448,756,630 bushels of wheat, the home value of which was $580,486,217; while in 1875 they produced only 292,136,000 bushels, and yet received $555,445,930. By these facts we find that the smaller crop of 1875 was but 65 per cent. of that of 1879, yet the value of the smaller crop was over 95 per cent. of that of 1879. So these statistical facts reveal the truth, not generally accepted, that frequently short crops are blessings to producers. The wheat crop of Indiana in 1879 was about 44,000,000 bushels, and its home value was $45,000,000. The wheat crop of Indiana for 1881 was a short crop, being 30,625,668 bushels, and yet its home value was $41,650,908.

Carefully collected vital statistics in Massachusetts show that the average age at death of 28,000 farmers was sixty-five years, while that of 123,000 persons of all classes was fifty-one years. The lives of the wives of farmers were found to be much shorter, and the defects in the sanitary surroundings of the home, such as cess-pools, hog pens, privies, etc., were found to be the cause of this. And thus statistical science, by the collection and comparison of facts, have an important bearing on health and longevity, and suggest the necessity of improvement of the surroundings of the home. Another illustration of its importance right at hand may also be mentioned. During the year just closed, finding a single township in Indiana which was rather level, and until late years without tile drainage, the Bureau of Statistics of Indiana instituted an investigation to ascertain the effect of drainage upon health. A period of five consecutive years before tile drainage, and a like period of five years after such drainage, was selected. Physicians who had during these two periods practiced their profession there, attending all who required medical services, were requested to consult their books for the data respecting the number of cases of malarial disease. It was found that for the first period of five years before tile drainage, there had been 1,480 cases of such sickness, and during the second like period after drainage there had been but 490 of such cases. Similar collections of facts have over and over shown like beneficial influence of tile drainage upon production.

The mission of the statistician is to produce the raw materials from which the scientist, statesman, political economist and philosopher, may deduce substantial principles which become the basis of the best civilizations. Neither the one nor the other can know with any certainty the true lines of thought and action except by the comparison of classified facts bearing upon the subjects in hand. How shall National and State legislation proceed with any degree of intelligent direction, when members of these bodies have no access to facts bearing upon all the subjects which shall come before them for action? No one who will with some degree of patient thought, study the systematic collection and classification of facts upon health, commerce, agriculture, education, manufacturing, mining, criminals, etc., will ever thereafter ask "What is the use of statistics?"

Mr. Jones. I would like to know the method of gathering statistical facts.

Mr. Conner. The law organizing the department of statistics requires reports from all public officers. There are from

150 to 175 questions asked the assessors of the various townships of the State. They are requested to answer these, which are returned to the trustees of the township, and he sends this as well as the acreage of the spring crop and other facts to the Bureau. The trustees are also requested to ascertain in the fall, of the machine men, and from such other sources as they may call to their aid, and make an estimate of the wheat and corn, which they also forward to the Bureau. We have about 1,011 assessors, and a like number of trustees, who make out their reports as to the yield per acre, and we make out our estimate on the same basis. It is on the same basis that the census reports are made. The Bureau will begin issuing monthly bulletins about the first of March, on the same basis of the National Department, and reporters are requested to send in reports on a certain date.

Mr. Mitchell. How long will that report continue in the season?

Mr. Conner. It will continue clear through the season into January. It is believed that if those reports can be had they will be very desirable to the producer, and if such information can be made monthly it will afford a large margin of information in selling. It will include all kinds of crops, stock, etc.

President Lockhart. Can you give this Delegate Board any reason why this work of procuring statistics should not come through the State Board of Agriculture as well as through the Bureau. I think this should be a feature of the State Board of Agriculture.

Mr. Conner. I have thought but little on that subject. The agricultural statistics are of chief value to the agricultural classes, but it is a small part of the field. I suppose, of course, that Commerce, Railroads, Education, Meteorology, etc., might as well be conducted under the direction of the Board of Agriculture as any other. The chief thing is to put all the statistics in the office of the statistician, as all statistical matter should go into one volume, and this volume should go into all the libraries of the States. I do not know whether the reports of this Board go into the libraries of the United States and Europe or not. When I came into the office I was surprised to find the amount of correspondence they have listed. It must be borne in mind that agricultural statistics is only a small part of the work of the statistician. We will have pretty extensive railroad statistics this year. Quite a number have made full reports, and especially all the Trunk lines in both passengers and freight.

Mr. Haynes. It is your duty as State Statistician to collect facts. Do you believe there is any better method than is now employed in gathering agricultural statistics in Indiana.

Mr. Conner. To answer your question—the Department of Statistics of Indiana is the outgrowth of the best experience in the world. To make it better will take a long time. The law in Indiana on this subject is broader than any law in the United States. The law creating this in this State covers everything we can think of; after mentioning all it says, "and such other things as the Bureau may think best."

Mr. Mitchell. If you divide them the agricultural statistics should be sent to the Board.

Mr. Conner. The methods employed are public methods, officers are called on to make these reports and the Bureau of Statistics issue their report in January; your body does not issue until in March. The Secretary of this Board may issue statistical reports and publish in the Bureau report before *their* report of the Board is ready.

Mr. Kirkpatrick. There is some anxiety that is unnecessary. We have the statistical department, and the chief is here to explain how he obtains his information. As an agricultural board, we are trying to get the agricultural part of statistics so we can have the benefit of it each month. If we have live men to represent us in each county, we will obtain from them something that will be reliable, and we will get this information every month. It seems to me that there should not be any anxiety on the part of this board in this respect, for Mr. Conner says he is going to issue reports each month.

Mr. Haynes. I am on the eve of my departure; as a resident of Indiana, I am not only grateful but really proud that we have the arrangement for the wisest heads to gather all the statistics on all branches of industry; so when we want, we can lay our hands upon them. Just now I want to sound one key note to the newly elected board. There are sixteen gentlemen on this board, but let me say you have an important duty to perform; and whenever you represent and try to control the agriculture and mechanics of the State, you have got your hands full. Gentlemen, I say to you, discharge your duties to the best of your knowledge for you have a great and grand work before you.

Mr. Conner. It has been proposed to have all the States collect the crop reports from the counties, and consolidate them into one report to the National Department of Agriculture. The Department at Washington can then announce the condition of the crops to the public, through the press and otherwise, *for all the States.* In this way the reports can be made very accurate, and furnished to the farming community in due season.

Mr. Kirkpatrick. We should feel hopeful for we are to be supplied with those reports monthly. If we get these reports monthly we do not need anything else.

Mr. Jones. It seems to me that the arrangement he has effected with the National Agricultural Bureau is certainly the embodiment of perfection, because it gives a bird's-eye-view of the crops, and it comes from a source that we can rely upon as being correct.

Prof. Bloss. There is but one difficuly in furnishing statistics. After sending out blanks over the State it is hard to get them properly filled, as there is difficulty about understanding it. I know of no better plan than is being carried out at present by the statistician. I doubt whether any private organization could reach the facts so readily as the present statistician, as he has the power, or might demand the power of the State in furnishing them.

FENCING OF THE FUTURE.*

BY HON. R. M. LOCKHART, OF DEKALB COUNTY.

Mr. Chairman, Ladies and Gentlemen:

The subject assigned me in the work of the Farmer's Institute is one of very great importance to every man and woman in the land that is engaged in farming and gardening.

When we take into consideration the vast amount of money and time that is required to properly subdivide the lands of the country for farming purposes, to give the matter the attention it deserves, we should look back at the fences of the past and compare them with the fences of the present, and then we can more properly determine the fence for the future.

The older farmers that are present no doubt well remember the many hard days' work put in by them in mauling rails, and in building fences on the new farms on which their younger days were spent. I have a very distinct recollection of those days myself. In the early settlement of this State, and in fact of all the timbered States, the very choicest trees were selected for the purpose of making into rails. The preservation of timber was not then thought of by the early settlers, and in fact it was looked upon as an incumbrance to the land. Trees were cut and worked into rails that, if standing on the farms to-day, would readily bring fifty dollars to one hundred dollars each. That day is past, and to the observing farmer of to-day who spends any time in traveling over the country, a very different state of affairs exists. Instead of the great old staked and ridered fences of twenty to fifty years ago, and small fields of five to ten acres each, he finds larger fields surrounded by fences made from the remnants of those made in earlier days, and in many cases he finds the old fences looking very dilapidated indeed.

In later years the farmers have to a great extent abandoned the plan of splitting up their timber into rails, and have adopted the less expensive method of making fence by having their timber sawed into lumber for fencing, which enables them to work up a class of timber that could not be split into rails. But that is also being abandoned, for reasons that I will endeavor to give you.

To go back to the consideration of the old rail, or worm fence as it is usually called, I think almost every farmer will admit that it is a great nuisance on the farm, occupying as it does a strip of land seven to eight feet in width that is worse than useless to the farmers. I say worse than useless, as he not only loses the entire use of that much land, but is subjected to a loss of time in keeping the fence corners clear of briars and elder bushes which seem to grow spontaneously in such places; and observation teaches us that as a general rule the farmers fail in their attempts to keep their fence corners in presentable condition. They are also a harbor for all kinds of animals or vermin that prey upon his growing crop, Now a word as to board fences; while they do not occupy near the quantity of land in their construction and their freedom from the growth of briars, etc., and are much more sightly in appearance on the farm, I think it has been pretty thoroughly demonstrated to the farmers that have adopted them that they are an expensive luxury. I have been experimenting on the construction of board fences for the past twenty years and find it almost impossible to construct a fence that will stand up against the wind storms that prevail so generally all over the country. But the main objection to building board fences at this time is that the timber has become so valuable no farmer can afford to use it in that way. When we take into consideration the vast amount of railroad building that is going on in the country, and the millions of feet of lumber that is required every year for *Railroad Ties*, and for the construction of cars, we can readily see that it is only a matter of time when all the available timber in our country will have been consumed in that way.

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*Prepared for the Annual Convention, January, 1882. Delivered at Crawfordsville Farmers' Institute.

In many places in this State, as well as in other States, the farmers are begining to realize the fact that good timber for fencing purposes is growing very scarce indeed. I have propounded this question to a great many farmers within the last year. Suppose by some accident every fence on your farm destroyed, have you timber enough left on your land to replace them? I have found but one man to say that he thought he had. Such being the case, you can readily see that something aside from timber must be substituted for enclosing the farmer's fields. Next to timber the construction of hedge fences comes in order. I would like to hear from any farmer that has made the construction of a hedge fence a success on his farm The osage orange, the red thorn, the privet bush and the willow, have all been tried in different parts of the country. And in my travels in eighteen States of this Union, I have the first farm to see yet where the making of hedge fences had been made a success. 'Tis true that I have seen some fences of hedge that answered a very good purpose, but almost invariably you will find breaks in them where the material has failed to grow, and which requires the substitution of something else to make a complete fence. I am acquainted with many farmers that have worked for years trying to get a hedge fence that was satisfactory to them, and I have not found one yet. I look upon them as being a great nuisance on a farm. As a general thing they take up more room than the rail fence. I remember once of going over to a farm in Illinois where they had planted osage for one of the division fences. The hedge had been very much neglected, and the branches extended out on each side so that a measurement at the breaks in the hedge showed that a strip of land full twelve feet wide was occupied by the hedge. This amount of land was a total loss to the owner. In passing along the public highway we often see where an attempt has been made by the farmer to construct a hedge fence. The failure to succeed in getting a good stand, as I have heretofore said, has caused him to neglect the plants that have grown, and the result is to give to the farm a very shabby appearance. When the shoots have grown thickly, and the farmer has neglected to keep them properly trimmed, they cut off a view of the farm, and make a very unsightly appearance. I am aware of the fact that companies have been formed in this State for the purpose of planting and cultivating hedges, and I am in hopes they may succeed. But my own judgment of the matter is that it takes too long a time to get a hedge fence grown to a height and sufficiently compact to serve all purposes, and too much ground is occupied to ever make a success of it.

Taking for granted that I am correct in my conclusions. We now come to the question as to what is to be the fence of the future.

This is called by many the Iron and Stone Age. Within the last twenty years, iron in the construction of fences has come greatly into use. We find it in many forms. The inventive mind has been at work to produce it in such shape as to make it available to the farmers of the world in the construction of fences, so that they may be able to substitute this material for that of wood that is now so fast decaying and passing out of their power to replace. The invention of what is known now as Barbed Wire for the construction of fences has wrought great changes in a few years. I well remember the first I saw of it. I was on a visit among friends in Illinois many years since, (I do not now remember the year,) and was invited by one of them to go with him to visit one of the leading farmers of that county, who was reported to be one of the livest men in Illinois. On going to his farm we found him in a small shop, busy at work cutting wire by hand into short pieces and with a pair of pincers putting them onto long wires and twisting them around the wire so they would hold on and form a barb. I must confess that I was not very favorably impressed with the idea at that time; living as I did then in the Northern part of Indiana, in a section of country so heavily timbered that it did not occur to me that a time would ever come in my knowledge that our farmers would feel the want of material to keep their farms properly fenced. But at the same time I could readily understand the reason why those farmers living in a Prairie country were seeking for a substitute for rails and timber with which to fence their farms. I said to the gentleman in reply to his question as to what I thought of his plan of constructing a fence, that I did not like it for the reason that I thought it would be a dangerous thing to put up on account of the length of the barbs, I think they were at least one inch in length.

I said to him then that I did not think such fences would ever come into general use. To show you how greatly I was mistaken in my judgment of the use of the same style of wire, I will say that this man, N. D. Glidden, afterwards got a patent on his invention and went into the manufacture of barbed wire in his village by machinery, and to-day if any one of you will take the pains to investigate the statements I am making, you will find that the village of DeKalb Center, in DeKalb county, Illinois, fifty-eight miles west of Chicago, contains three of the largest barb wire manufactories in the world. If you visit the village you will most likely stop at the Glidden Hotel, one of the finest hotels to be found in the west. And you will find this same old gentleman, now white with age, just as enthusiastic over the manufacture of barb wire as he was years ago.

He will tell how his patent barb wire is being introduced all over the world. He will also take great pride in telling you that in the year 1881 there was manufactured in and shipped from that same village 4,000 car loads of barbed fence wire. The location of these great manufactories at that point has changed it from a small village, as I saw it some years since, to a town of several thousand inhabitants. My business within the last three years has taken me over a large portion of country, mostly in the Prairie States, and it is astonishing to see the vast amount of barbed wire that is being used. On many farms in Iowa no other kind of fence is used. The great demand for this kind of fencing has started factories for its manufacture in many parts of the country.

It will be asked by some if there is not danger in using some kinds of barbed wire. I would answer, yes. There has been patents issued for the manufacture of some kinds of barbed wire, and the name given to one is well given, it is called the barbarous barbed wire, and every intelligent farmer can distinguish it from other varieties. From all I can learn from the farmers that have had it in use on their farms for years, there is not much more danger of animals being injured by running against it than there is in cattle sometimes attempting to jump over a picket fence and being caught on the pickets. It is said by those who have used it for years that stock bred and raised on a farm fenced by barb wire seldom come in contact with the fences. The instinct in animals teaches them where danger lies. I think by this time that you will have come to the conclusion that I have made up my mind to the fact that iron, in some of its forms, will constitute the fence of the future. We in Indiana can congratulate ourselves that we are so favorably situated. We have within our own State the iron and the coal to enable us to manufacture all the fencing that will be needed for ages to come. And I am gratified to learn, since coming here, that a company is already organized with a sufficient amount of capital, and in the hands of energetic men, to immediately commence the manufacture of barb wire in this great and growing city of Crawfordsville. I hope to see the enterprise prosper, as I believe the farmers of Indiana will gladly aid home manufactures.

ADDRESS OF PRESIDENT E. E. WHITE*

OF PURDUE UNIVERSITY.

I have had the pleasure each of the past three or four years of addressing you at some length on occasions of this kind, and again have been requested to respond in a few words in regard to the work in which we are engaged.

There is a close alliance between you and ourselves. I have noticed in the past five years a most encouraging advancement at home in agriculture, and especially do we see this change going on in the experimental stations, a large number of which are in operation now working out experiments, which we hope will be for the benefit of agriculture. These experimental stations must do for the whole country a great and noble work. There has been constructed at Purdue University since our last meeting a building for experimental work, at a cost of $4,000. This building is now completed and taken possession of. Every thing looks like work, and the work in agriculture will be given both experimentally and practically. We have a ten acre field nicely platted, which is under the care of Professor Ingersoll.

Next week the National Agricultural Convention will be held in Washington, under the direction of Commissioner Loring. Purdue University will be represented at that convention. If we could have a series of experiments representing the different kinds of soil, their adaptation and a final explanation, would be of great value to agriculture. I hope this convention at Washington will result in this, as you very well know that no one experimental station can tell for the agricultural interests of the whole country. We want reports from the different soils and climate, then when you come to eliminate you can get results that are valuable. I hope that the next two years will not pass from us without intelligent farmers being at work in the same direction reporting us the results. This is in its infancy, and the more we work at it the more we see to do. We are anxious to do this work and give instruction, and are anxious that this experimental work shall serve the agricultural interests of the State and country. I am very much encouraged from year to year with our work. You can put an institution on paper, but you can't put it into existence without a little time, and we are endeavoring to build up this institution as rapidly as possible.

We should have an increased confidence on the part of the State Board of Agriculture, and an increasing confidence in the mode of instruction and experiments in agriculture. If we make this industry pay in the future, we have got to supplement by skill and brain power what the soil has lost in its fertility. We must bring the best of science to aid in effecting this work. I remember when we had to go before a convention and discuss the training of teachers. A man is not born a teacher, but you can make almost anything out of him by training. We can do better if we know better methods. If we increase in methods, then we increase in power. This is so in agriculture. There is increasing demand in agriculture in the way of experiments. You want to ascertain how much wheat shall be sown to the acre. You make an experiment that one bushel is the amount for an acre of ground. You try this experiment next year and you find a different result. No question of this kind can be settled unless you have an aggregation of results. One kind of seed that is right for one kind of soil may not be right for another when we come to the variations to be made in seed. The farmer's head must be filled with brain, and we gauge his work by his intelligence.

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*Delivered before Annual Agricultural Convention, January, 1882.

For ten years past every agricultural advance in this country is the result of those experimental stations. The fact that we train and give instruction and knowledge as well as any school in the country will be appreciated by the farmers of the country, and our boys will be sent to Purdue not to take an ordinary course of education, but sent there with directions to come back to the farm with agricultural knowledge and skill. It is then that agriculture will build up. We are in our infancy yet, and working hopefully. Our classes are increasing in size, and the work which we are doing is very encouraging. I do not see why Purdue University should not have a delegate to represent it in this body.

LAWS RESTRICTING LIVE STOCK.*

BY L. B CUSTER.

What are the laws in Indiana in regard to restricting live stock? In the year 1852, the General Assembly passed a law entitled:

AN ACT concerning Inclosures, Trespassing Animals and Partition Fences.

(We will notice sections 2, 4, 5 and 6.)

SECTION 2. (As amended in 1877.) If any domestic animal break into an inclosure, or wander upon the lands of another, the person injured thereby shall recover the amount of damages done: *Provided*, That in townships where, by order of the Board of County Commissioners, said domestic animals are permitted to run at large, it shall appear that the fence through which said animals break was lawful, but where such animal is not permitted to graze on the uninclosed commons, it shall not be necessary to allege or prove the existence of a lawful fence in order to recover for damage done.

SEC. 4. When any domestic animal shall break into the inclosure of any person, such person, without regard to the season of the year, may take up such animal as an estray, whether the owner be known to him or not, and shall proceed as provided by law of estrays, except as herein provided.

SEC. 5. Such taker-up shall, within, twenty-four hours after such taking up, give notice to the owner of such animal, if known, and he can be immediately found.

SEC. 6. Such taker-up before posting or advertising, shall procure from two disinterested freeholders an examination and assessment of damages, with certificate of same, including reasonable pay for such assessment.

No doubt you very readily see from the above how complicated and inefficient the laws are. Too much machinery.

These are the only laws I believe in the statutes of this State bearing directly on this important subject.

We have outlived this complicated and impracticable law, which creates nothing but strife and confusion, and the people desire something that will relieve us from constant *petty annoyances*, as well as damages; a live law that *will prohibit* stock from running at large.

If we had a law making it the duty of the constable to impound all stock running at large, it would be an advancement that the times demand.

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*Delivered before Annual Agricultural Convention, January, 1882.

Who is to blame for this inefficiency of our laws? Not our law-makers, surely, but the farmers themselves.

Our representatives are ever ready to serve us when they are made acquainted with our wants. During the late session of the General Assembly a bill was introduced that had all the features of an efficient law, but the people did not urge their representatives to support the bill, or even make them acquainted with their desires, consequently that *ignis fatuus*, the poor man's cow, defeated the measure.

When the farmers demand that stringent laws be enacted to restrain stock, they will be passed.

By referring to the Report of the Bureau of Statistics for 1880, we find that there are 116,168,399 rods of fence in Indiana, a very low estimate, which at the lowest calculation would be worth one dollar per rod, making the enormous sum of ($116,168,399) one hundred and sixteen million one hundred and sixty-eight thousand three hundred and ninety-nine dollars.

Is it not high time that we make an effort to shake off at least a portion of this burden, and get rid of the notion of fencing out other men's stock, and only fence in our own.

From a paper by Mr. F. A. Gully, of Michigan, I quote. "It is a wrong idea or custom that compels the farmers to build thousands of dollars worth of fences, just for the sole purpose of fencing out a few cows and half-starved calves for some thriftless neighbors and "an occasional family who must keep a cow but own no land, and are too poor to hire pasturing." With great sympathy for the unfortunate, and believing it the duty of every one, to give a weaker brother or sister a helping hand, I can not help feeling that neither charity nor generosity demands that the highway should be given to the poor for a public pasture.

Having had ample opportunity to study the practical working of the road pasture, I concluded that if the time spent by hunting up their cattle, by some families, was put into some kind of honest industry, it would pay for pasture.

If there are families that can not live without keeping a cow in the road, let them be helped by private enterprise, or by the town authorities.

I fail to appreciate the pride that will not permit a man to ask for, or receive aid in this way for his family, but who would keep a cow in the public road, and compel a whole neighborhood to keep up expensive highway fences.

A certain writer said, that

"It has been a mooted point in the past, whether fences were intended to avert the destruction of corn by the cattle of neighbors, or to restrain one's own stock from similar depredations, for a long time the popular idea, logically interpreted, appeared to be, that corn should be restrained to prevent depredations upon cattle."

Mr. Meredith offered the following:

Resolved, That it is the sense of the State Board of Agriculture that domestic animals of any kind should not be allowed to run at large or pasture on the public commons, and that we respectfully ask the next Legislature to pass an act prohibiting the same.

Mr. Jones moved to amend by adding:

And make it the duty of the Road Superintendent, under adequate penalty, to impound all stock found running at large on the public highway.

Which was carried, and the resolution as amended was adopted.

DISCUSSION ON RESTRICTION OF LIVE STOCK.

Mr. Haynes. I look upon this as being an important question. I would like to have a law passed restricting cattle running at large. There are a great many men who have little or no land, and have more cattle than those who do. The result is they run at large and are constantly trespassing on their neighbors. It is the same way with hogs. I believe every man should be forced to keep his cattle up.

Mr. Meredith. Requests came to us last winter from professional men who did not really know the sentiment of the people, and we thought to be on the safe side was to let the law remain as it was. It is just as Mr. Custer has said, the farmers are to blame. If they would make their wants known to the Legislature, and pass resolutions to that effect, they will be noticed. It would be advisable for the State Board to ask County Boards of Agriculture to instruct their members of the Legislature to take some action in reference to this. If it is not the sentiment of the people of the State, it should not be enacted; but I believe it is favorable for a stock law.

CULTIVATING THE BLACK WALNUT.*

BY W. H. RAGAN, SECRETARY INDIANA HORTICULTURAL SOCIETY.

The Black Walnut (*Juglans Nigra.*)

On page 450, Report of the Department of Agriculture for 1870, occurs the following statement: "In January, 1866, there was brought to New York from the West a walnut tree, seventy feet long, containing 4,600 feet, board measure, which when cut into veneers, thirty to the inch, would be equal to 138,000 feet, worth at 20 cents per foot, $27,000. The estimated cost of cutting, carting and storing for sale, was $700." And again, though I can not give the author of this item: "A man in Wisconsin planted a piece of land with black walnut, twenty-three years ago. The land flooded spring and summer and was unfit for ordinary cultivation. The trees are now from 16 to 18 inches in diameter and have been sold for $27,000." As we are all aware, these are exceptional cases, but that walnut lumber now commands from $75 to $100 per thousand feet in this city, and that too, located as it is right in the midst of former groves of which any country might have been proud, is a fact beyond controversy. But this noble forest is gone, and we, whose immediate ancestors, a stalwart band of pioneers, toiled long and faithfully to remove the almost worthless cumberers of the ground, are to-day carefully engaged in gathering up the once accursed stumps for their commercial value. Not only this, but I to-day stand before this association of farmers, many of whom like the speaker, have spent weary days in contributing to the destruction of these monarchs of the forest, without one word of apology for advocating the claims of this noble tree, as pre-eminently

THE MOST WORTHY VARIETY

For artificial groves and timber belts. Although addressing myself to men, resident of a once densely forest-covered region, whose business for a half century has been the destruction of our noble forests, I shall reiterate the warning, "Woodman, spare that tree," and with it urge upon you the propriety of devoting a few spare acres to the cultivation of a walnut grove. I know it has been sneeringly said by our prairie neighbors on the West, that they could raise corn and have it manufactured into whisky and glucose, for which they could barter us Hoosiers out of our timber, cheaper than they could raise it. However true this may have been in the past, I am satisfied that it can not long be practiced, unless we defeat

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* Delivered before Annual Agricultural Convention, January, 1882.

"prohibition," or plant groves at an early day, since we are so rapidly learning the true value of our timber. Before presenting my subject in detail, I will briefly allude to the fact that horticulturists, rather than agriculturists, have been first to advocate the claims of artificial forestry. This is but natural, since their occupation leads them directly to this result, the propagation and care of young trees being to them a source of revenue, and in view of the fact that their tender and precious crops are more susceptible of unfavorable influences by climatic changes incident to the removal, or partial absence of forests and groves. But after all, the farmer has the greater real interest in this subject. In the first place he has the broad acres on which to grow timber; he, too, is greatly interested in the preservation of moisture and the amelioration of climate incident to the culture of timber; his herds and flocks receive comforting shelter, both winter and summer from his groves, while fuel and timber for his own comfort and profit result therefrom. Having thus briefly argued a few of the points of interest to the agriculturist, in the subject in hand, and assuring you that this is a work that must be begun in anticipation of a period of absolute necessity, if we would provide against a timber famine in the near future, I will proceed to lay before you a few of the many arguments in favor of

THE BLACK WALNUT,

Which, in my judgment, give it pre-eminence over all other varieties. In point of quality, as relates to the actual value of the timber, I could not add to the testimonials quoted at the head of this paper. It is doubtful whether any tree of any variety has ever proven of more value than the one cited, and the quality of the timber is such that no fickle whim of fashion can seriously depreciate its value. It is true, black walnut is not celebrated on account of its durability when brought in contact with frequent changes from a condition of dryness to moisture, and hence is not so valuable for posts and cross ties as many other species, but for other purposes, from the finest parlor decorations to the external finish of the roughest out-buildings, it stands without a peer.

It is indigenous to our soil and perfectly hardy, not requiring acclimation; it is comparatively free from the attacks of depredating insects; it grows rapidly into a tree of noble proportions. In the economy of its nature, it gathers from the elements, and annually deposits through its decaying foliage, bark, etc., a fund of wealth to the soil, that has, in Hoosier parlance, conferred on it the title of "witness tree," it being regarded as a "witness" to good soil. It bears at an early age, and annually thereafter, full crops of nuts, that even now possess a commercial value, equaling if not excelling the average value of a grain crop, and in this particular, if in no other, yielding a yearly income far above that of most, if not all, other trees that have been recommended for artificial forestry.

HOW TO PLANT AND CULTIVATE.

All nut-bearing trees are difficult to transplant. This is due to the fact of their invariably starting from the germ with a strong radical or tap root, which is apt to be seriously cut back in digging. On this account nurserymen avoid the culture, and especially the recommendation of nut-bearing trees. One of the principal elements of the popularity of the Catalpa Speciosa, and one no doubt which prompts many fabulous statements concerning its extreme durability, is due to the ease of propagation, and facility and almost absolute certainty of success attending its transplanting. This has also given unmerited reputation and prominence to numerous other trees of far less value than black walnut, or even the Catalpa Speciosa. But fortunately what would be an objection to the black walnut, when viewed from the nurseryman's standpoint, that of self-interest, is really one of its desirable qualities. It is not necessary that you should have your trees furnished ready made by other parties. You can grow your own black walnuts, and that, too, without the risk of loss, or the back-aching labor of transplanting. Prepare your ground by breaking and harrowing in the fall. Furrow it off each way as you would for corn, except that the rows should be about seven feet apart. Take the nuts fresh from the trees, it is not necessary that they should be hulled, placing two nuts in each crossing. This is to insure getting a good stand. The nuts should be covered very shallow, just enough earth to hide them. In the spring the land should be furrowed off midway between the rows of nuts, and the spaces planted with corn or potatoes. Cultivate as you would a corn crop by cross plowing, being careful to give the young trees a fair chance and good clean culture. The second spring thin out your plants to one tree to the hill. If there are spaces entirely missing, they may be filled by transplanting from the hills containing duplicates. The second, and perhaps the third year, it will pay to cultivate corn between the rows, after which the trees should be regularly cultivated until they fully occupy the ground so as to keep down by their shade all weeds and grass. The period at which cultivation may be discontinued can not be definitely stated, as much will depend on the character of the seasons and quality of the soil. Of course seven feet each way will be too close for permanent trees, but as they will protect each other when small and make much better growth, it is preferable to have them closely planted. When they begin to crowd, the alternate tree in each row may be removed. The trees thus removed will be of sufficient size to be useful in various ways on the farm. A second thinning will in a few years be necessary, taking the alternate tree the other way. Your permanent trees will now stand fourteen feet apart each way, a sufficient distance for a number of years, though not for large trees, but the thinnings will always pay a large per cent. on the value of the ground occupied. I shall not weary your patience by an array of figures to convince you of the probable value of an acre of black walnut timber at a given age, but only remark that at fourteen feet each way you would have something over two hundred trees, and that trees that have grown without culture, within my recollection, and I am not yet fifty years of age, will now readily bring five dollars each, and that such trees are sought after with diligence and are being shipped from every railroad station in Central Indiana. I will now close this paper, already too long, with the prediction that he who plants a walnut grove, caring for it afterwards, will leave to posterity a richer inheritance by far than the man who buys and sells on margins.

Mr. Conner. Do you propose to thin or prune the trees?

Mr. Ragan. They will prune themselves. They will do widely different from those we see in the fields and along the road side, which have large short bodies and wide spreading tops.

Mr. Conner. Trees must be planted pretty thick and cultivated so they can make long trunks.

Mr. Ragan. I would recommend planting seven feet apart, and thin out as you need.

SHEEP HUSBANDRY IN INDIANA.*

BY HENRY C. MEREDITH.

The number of sheep in Indiana in 1880 was 1,013,032, and 525,828 lambs making a total of 1,538,860. The estimate value of which, at $3 per head for sheep and $2 for lambs, makes a total valuation, $4,090,752. There were in 1880, 17,017 breeding rams in the State at an estimated value of $11 each, making them worth $187,187.

In 1870 there were 1,612,680 sheep in the State, as lambs were not estimated, it was a larger number by over 50 per cent. than we had ten years later, or even a larger number than in 1880 counting the lambs.

In 1860 Indiana had 991,175 sheep, not nearly so many as in 1870.

In 1850 we had 1,122,493 sheep, showing that thirty years ago there were more sheep by over 100,000 in the State than we had one year ago.

In 1880 with 1,013,032 sheep, we produced a crop of 3,893,715 pounds of wool, an average of nearly four pounds per head, to be exact, 3.85 pounds.

In 1870 with 1,612,680 sheep we produced 5,029,023 pounds of wool, equal to 3.12 pounds per head. Of the one hundred million pounds produced in the United States, we produce about one-twentieth part.

In 1860 we produced 2,552,318 pounds from 991,175 sheep, making an average of 2.57 pounds per head, being that year about one-twenty-fourth part of the total production in the United States.

In 1850 Indiana produced 2,150,112 pounds from 1,122,493 sheep giving an average of less than two pounds per head, and about one-twenty-fifth part of the total wool production in the United States.

In 1850 we had about one-nineteenth part of all the sheep in the United States, and in 1870 the one-seventeenth part, and was the fifth State in number, showing that we have a great sheep growing State.

COMPARATIVE VALUE OF SHEEP AND HOGS.

Indiana has been known as a great hog producing State, yet we find that in 1870 there were 146 manufactories of woolen goods, employing 2,395 hands, with a capital of $3,770,513; the wages amounting annually to $717,176; materials used were worth $2,995,604, and the products thereof brought the splendid sum of $4,212,737. While the pork packing establishments consisted of 11 in number, employing 452 men, with a capital of $1,598,000. The materials used were worth

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*A paper read before the State Board of Agriculture, January, 1882.

$2,262,737, and the products only brought $2,780,021. It will thus be seen that the products from woolen factories in our State exceeded in value by more than one and a half times that of the pork packed. This makes a good showing for the sheep, and we have his carcass left.

There was only one manufacturing industry in the State in 1870 the products of which exceeded in value that of woolen goods, viz., sawed lumber. From the foregoing it will be seen that the total number of sheep was not so great in 1880 as in 1850, thirty years previous, yet from the lesser number we produced more than double the amount of wool in the aggregate while the average per head is almost trebled. In addition, the quality is far superior, and the carcass is much more valuable for the market.

PROGRESS IN SHEEP HUSBANDRY AND METHODS.

These advances show that we are progressing both in the care and breeding of our sheep, two requisites of success.

The improved breeds that are being crossed upon our native sheep (the valuable results of which may be seen on almost every farm) may be classed in three general varieties—

First. The long or coarse wool breeds—Cotswold, Leicester and Lincoln.

Second. The medium wool breeds—Southdown, Shropshire, Oxford and Hampshire.

Third. The fine wools—Merinos.

The first named is most largely used, a cross of which upon our Native sheep gives a much longer and heavier fleece, greater size of carcass with improved mutton qualities. This cross is generally desirable where the flock is kept on the low rich lands.

The Downs are used principally to improve the mutton qualities, to give vigor and constitution and to add to the market value of the carcass. The South Down particularly gives fineness of texture and delicacy of flavor to the flesh, with the fat and lean well marbled. English butchers leave the black hair on the legs of the carcass to show their customers that the sheep is a Down. These sheep are preferable on the higher lands where the grass is short and a hardy, active, thrifty sheep is required.

PURPOSE OF CROSSING BREEDS.

The Fine Wools are used to cross on the natives to reduce the texture and increase the density and weight of the wool. They also add to their mutton qualities, but are not noted for this property owing to their size.

This cross is most valuable in large flocks, as they herd well together. They are not so prolific nor so good mothers as either the Cotswolds or Downs. The lambs are harder to raise than those of any of the other breeds.

Pure bred rams should at all times be used on the flocks, otherwise a mongrel is produced that has no distinctive type nor increased value over the parent. Farmers can improve an ordinary flock from 20 to 50 per cent. every year by using well selected pure bred rams, but they should never be tempted to save their nicest ram lambs to sell or keep for breeders. When the cost of extra care, annoyance of would-be-purchasers and trouble of shipment are all accounted for, it will be found that more money will be made to buy from the flock of a reliable professional breeder, who makes the highest order of merit a specialty. The gain made in the increased value of the produce of the flock will in one year more than pay the price of a good ram.

INDIANA WELL ADAPTED.

The lands of Indiana are well adapted to sheep husbandry from their production of the sweetest and most nutritious grasses, the purest water is plentiful, and the climate is well suited to the successful pursuit of this most profitable industry, while the markets, through our network of railroads, is at our own door. When lands are highest in market value, no crops or stock yield a revenue like that which comes from a flock of sheep; and when the soil is thin, hills steep and rocky, its most profitable use is for sheep.

More than any other animal do they enter into the economies of the farm. They produce two crops per year, wool and offspring; their flesh is heathful and delicious; their products bring a ready cash price; and as they are easily cared for, there is no reason why sheep husbandry should not be greatly extended in the State.

The intelligent care of domestic animals is both elevating and humanizing, none more so than the care of the flock. With all the rough usages, the constant care of things lovable and helpless, can not but make one simple minded and tender hearted. Gen. Wallace says of the shepherds of Judea: "If in narrative they dwelt long upon affairs of trifling moment, if one of them omitted nothing of detail in recounting the loss of a lamb, the relation between him and the unfortunate should be remembered. At birth it became his charge, his to keep all its days, to help over the floods, to carry down the hollows, to name and train; it was to be his companion, his object of thought and interest, the subject of his will, it was to enliven and share his wanderings, in its defense he might be called on to face the lion or robber—to die."

HOME AGRICULTURAL EDUCATION.*

BY PROF. R. T. BROWN.

Of the three great productive industries, Farming, Manufacturing, and Mining, the first employs more than half the labor of this country. In some of the European countries, labor is more equally divided; but until all of our available territory is occupied and cultivated, this preponderance of agricultural labor will continue to be the rule in the United States. While the opportunity for acquiring a fair education in the primary branches, is furnished to all classes by the public schools in the Northern States, and the same system is making commendable progress in many of the Southern States, yet this common school course, at its end leaves the pupil without any special training for any particular pursuit in after life. To remedy this defect, somewhat, the General Government has liberally endowed an industrial school for each of the States; but the benefit of these schools, directly, can accrue to but a very small section of the agricultural labor of the State. Not one in an hundred of those who will till the soil for the next generation will ever enter the classes of Purdue University, however valuable the instruction they would receive there This defect is more important in its bearing on agriculture, than on either of the other productive industries. In mining or manufacturing, one educated and well-trained mind directs the work of hundreds of hands. Even in agricultural labor, under the landlord and tenant system of the Old World, the intelligence of the landlord may, to a great extent, be a compensation for the ignorance of the laborer; but in this country where, happily, nearly every farmer is his own landlord, and every landlord his own tenant, the whole mass of agricultural labor should be, at least so intelligent as at all times to know what they are doing and why they are doing it. But when and where, and how is this knowledge to be obtained? We are not ignorant of the difficulties that environ this subject; but we think the time has fully come when the intelligent thought of the best thinkers of the age should be directed to this point, however formidable the obstacles that may lie in the way.

The list of common school studies is already filled, and more than filled. To complete it in the time allowed often requires an unwarranted degree of cramming. There is no room here for direct agricultural studies, unless it can be made by curtailing some of the assigned branches. The higher arithmetic and the philosophic departments of grammar, which are considered merely as instruments of mental gymnastics, may give place to exercises preparatory to agricultural studies.

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*A paper read before the State Board of Agriculture, January, 1882.

The central thought of a primary education is to teach the pupil to think. It matters not how much the pupil may *know*, if the power to think is not acquired he is not educated.

But thought is a labor, and like all other profitable forms of labor, it must have material to work on. We can not think without something to think about. In our present system of education this material of thought is gathered mainly from books, and much of it from the abstract sciences. The great volume of nature around us, and the perceptive faculties by which the Creator designed that we should read that volume, are almost wholly neglected. Our boys and girls at school or at home learn to think about far-off things, while they are too often blind to their immediate surroundings. The result of this is that when time and opportunity for acquiring book knowledge is no more, amid the pressing duties of life, the supply of thought-material is cut off and mental growth is arrested at once. The book of nature is open before them, but not having learned to read its language, it is to them a sealed book. The eye is the first and most important avenue of knowledge, and the other senses follow in regular order. Natural education begins in the cradle, and the mother, as the first educator, has but to guide the attainment of knowledge through the senses. The order of this education is systematic—

First. To know things.
Second. To know their properties.
Third. To know their actions and relations.
Fourth. To know their uses.

This education may begin in very early life, for the faculties of observation, perception and comparison are the earliest of our human developments. These habits of observation and comparison early cultivated, soon grow into a passion, the passion of curiosity, the most active of all our passional endowments. This kind of cultivation is a good foundation for any education, but in a successful agricultural education it is indispensable. The life of a farmer is a life of close communion with nature, and his trained senses are the avenues of his communications with her, and in the solitude of his daily labors he learns her varied language. It may furnish him a moment's food for thought to know that the three angles of a triangle are equal to two right angles; but when he apprehends the truth he does not perceive what he is to do with it, and he suffers it to die there. But when he learns that a grain of corn will require a temperature of 60° to wake its germ into life and make it grow, he sees at once the relation of that truth to his business, and following the train of thought, he starts out to ascertain the germinating temperature of other seeds, and that will suggest other conditions, such as the influence of excessive moisture or heat; and thus will be opened a broad field of pleasant and profitable observation and research.

In this study of things rather than books the exercise of the kindergarten and the object lessons that, to a limited extent, have been introduced into some of our primary schools, are steps in the right direction, which might be greatly extended with profit. Nature is an inexhaustible book that children will study as an amusement rather than as a task. Fifteen minutes of each school day could be profitably devoted to the education of the perceptive faculties. The different kinds of trees and shrubs, their peculiarities of growth and the properties of the wood of each; flowers and their parts, and the arrangement of these in the different kinds of flowers; leaves, whether simple or compound, and how arranged on the stem; animals and their habits; insects, their structure and modes of life, etc. All this, not so much for the value of the things learned, as for the habit of close and careful observation acquired in learning them. If we have not learned to *observe* carefully and critically we will be apt to *think* loosely and carelessly. Many persons who are intelligent in books, and even wise in the abstract sciences, pass through the world with eyes that see not, neither do they perceive. They could not tell you how many legs a fly has, though they have brushed the pest from their nose for fifty summers. They could not name half a dozen trees in which the leaves are arranged opposite in pairs on the stem, though they have lived among trees from their childhood.

Less than fifty years ago, when the physical sciences were first introduced into our schools, it was customary to teach everything from text-books, and to teach all the facts and theories of a science in the abstract. Chemistry was taught by the student committing its formulas to memory, and looking at a few amusing experiments on the professor's table. Botany was learned by memorizing the names of the different parts of a plant, a flower and a leaf, and mastering a long catalogue of Greek and Latin names of orders, genera and species. So of Geology and all the other physical sciences that are directly connected with the practical arts. Science alone was taught in the schools, art belonged to the workshop, the factory and the fields. But science alone is a crusty old bachelor, and to make his acquaintance is a dry business; but when he is married to art he becomes social, and is indeed a very agreeable companion. But education has turned a new leaf, and every material science is taught in connection with its art. Chemistry is taught in the laboratory; botany among the plants and flowers; geology among the rocks; and why not agriculture in the fields? I am fully convinced that it can be profitably learned no where else. But this does not by any means dispense with books and lessons on the nature of things and our treatment of them. Let the art and the science be acquired together. This is natural education.

The habit of acute perception and careful observation, early cultivated and firmly established, leads to a desire for knowledge from other sources. The students of nature who carefully observes his own surroundings soon feels a desire to know what others have observed, who have explored a wider field, and have enjoyed better opportunities than have fallen to his own lot. With this desire begins the practical work of education, all before was preliminary. Here let me notice one of the mistakes of the times. The idea that a teacher is a necessity in every branch of study is a mistake that has paralyzed the energy of many an aspiring youth. A good teacher is a convenince, and nothing more. His business is to direct the course of study, the work must be done by the student, or not done at all. But young men and women with the previous mental training which we have indicated, will find but little trouble in acquiring a respectable knowledge of the sciences of agriculture and domestic economy,-in their practical application to the business of farming and housekeeping. We would recommend that both sexes pursue the same course of reading and study, for no farmer's wife knows how soon the care and management of the farm may devolve on her as the legacy of her widowhood. On the other hand, every man who provides for the material consumption of the household, should understand domestic economy, to avoid mistaken notions about the necessary expense. Each should understand the business of the other, that husband and wife may sympathize with each other in their respective fields of labor.

The time when there were no books on farming in the American market is within the memory of those yet living; but now agriculture has a literature that will compare favorably with that of any of the other sciences. It is true that the mass of agricultural literature is yet crude and undigested. This is the necessity of its infancy. Many of our books are burdened with unnecessary details of matters that should be left to the common sense of the farmer, and often these relate to processes that must be varied with the ever-varying circumstances of each individual case. But there is less of crudity, conjecture and speculation, based on mere hypothesis than was found in any other science in the first century of its existence. When Sir Humphrey Davy advanced the idea that there is a science underlying the art of cultivating the soil, he was ridiculed and the idea laughed to scorn; but his agricultural chemistry struck a few advanced thinkers in England, who, conforming the art to these scientific maxims, gave birth to what in that country is called "high farming," the good results from which did more to break down prejudices in the masses than a century of argument could have done. The labors of Liebig and Boussingault, on the continent, re-inforced Davy, and the echo from this country was a hearty response from hundreds of intelligent farmers, who hastened to conform the agricultural art to the dictum of science as fast as its principles were demonstrated. In this formative stage of the science, the American press teemed with books on detached branches of the science. Within the last few years several elaborate works have appeared with the design of embodying the whole subject in a single book. They are well enough adapted to the mature student, but the beginner needs a primary work setting out in plain and concise language the elementary principles of agricultural chemistry and physiology, animal and vegetable, together with the physical laws of evaporation, condensation, absorption, etc. These should be set out in their relation to the growth and maturity of crops, and the care of domestic animals. The whole should be comprised in a space not exceeding three hundred pages, and should be entirely free from technicalities; indeed, it should not contain a word that is not found in Webster's dictionary. With such a primary work, the pupil, fresh from the public school, may, without a teacher, be prepared to successfully enter on a general course of agricultural reading, and thus prosecute his agricultural education the remainder of his life.

The science of agriculture is a compound one—a convergent science to which all the branches of physical science contribute more or less. It is not expected that a home agricultural education should embrace more than a rudimentary knowledge of the sciences, for it is a knowledge of general laws and fundamental principles, rather than theoretical details, that is required for practical work. This diversity of agricultural studies, which at first view appears to be an obstacle, is really of great value in developing the mental powers. Some of the sciences when pursued as single studies, have a tendency to distortion and narrowness of mental development. On the other hand, the study of agriculture embraces a broad field, and tends to the cultivation of a corresponding breadth of mind and a wide range of thought.

But it will be urged that the demands of farm labor leave no time for this course of study, and that the knowledge that is not obtained in school will never be acquired. To this our reply is: Economize time. In the average farm life of this country there is a great waste of time. It may not be in the spending of an afternoon, once a week, in the vicious habit of loafing around the village store or cross-roads' grocery, but still "the odds and ends of time"—half an hour now and an hour then, now a rainy day, and then the long winter evenings—these fragments that are too often wasted, would if properly used, enable any farmer to make a respectable progress in obtaining a knowledge of the science on which successful farming rests. The Farmers' Club, or the Grange meetings may be made important auxiliaries in this home education. Here allow me to allude to the special opportunities which farm life affords for self culture. Young men are apt to make the sad mistake of supposing that a clerkship in the city, or some other semi-intellectual employment will afford better opportunities of self-education than can be found in the labor of the farm. To say nothing of the temptations to vice, which the young are not always able to resist, the labors of the counter or the desk are exacting—they leave the mind no time for quiet reflection or sober thought; but in the manual forms of labor, whether on the farm or in the workshop of the mechanic, the hands trained to their task, soon learn to do the work with but little mental oversight, leaving the mind free to recall the subjects of the last evening's reading, thoroughly investigate each topic and firmly fix them in the memory, thus economizing the time and relieving the labor of much of its burden, for work that is done without the direct supervision of the mind is almost unconsciously done.

Another advantage that will accrue from this appropriating the fragments of time is that it will secure those who adopt it against the liability of forming the pernicious habit of idleness. Either the mind or the body, or both, should be actively employed during all the working hours. This is the normal condition of our faculties. There is an Arabian proverb that says, "The Devil tempts all men, but the idle man tempts the Devil."

I trust you will pardon the egotism, if I conclude this paper by telling you what I know from personal experience about the possibilities of home education. Before I was fifteen years old I finished my school education at the common schools as they were sixty years ago, and from that onward, with the exception of my course at Medical College, I have not enjoyed the benefit of a teacher in any branch of learning. But, perhaps, more from accident than from anything else, I early acquired the habit of going through the world with my eyes open, and carefully observing everything that came within the range of my vision. Such a habit is not considered polite, and I was regarded as *green;* but I need not remind these farmers that greenness is an indispensable condition of growth, at least in the vegetable world. In a busy life, covering more than half a century of professional labor I have devoted the fragments of my time to self-instruction with the result of acquiring, at least, an elementary knowledge of a tolerably wide range of science and literature, not indeed an exhaustive knowledge such as may be acquired in the classes of Yale or Harvard, but such a degree of proficiency as has secured to me the unsolicited recognition of one of the best literary and scientific institutions of learning in the State. I allude to this to encourage young persons to begin early, the work of self-culture, for the opportunities for this work are infinitely better now than they were half a century ago, and what was done then may be more easily done now. But it is in no spirit of exultation that I thus review the years that are gone. The ghost of wasted time and golden opportunities unimproved, rise before me and cast a sombre sadness over the reminiscence. I lost five years of the prime of my life by suffering myself to become involved in debt. While extricating myself from this dilemma, I was in no mood for prosecuting any other study. But the years were not wholly wasted, for I learned how to keep out of debt, an important branch of education. Again, I lost a year in following Horace Greeley in his vagaries of community life; but I learned the folly and impracticability of the theory at a less cost than did the philosopher of the Tribune. But my deliberate judgment is that a life reaching into nine decades of the nineteenth century should have accomplished more than I have done.

FOOD SUPPLY.*

BY J. E. THOMSON, WATERLOO, IND.

Permit me to claim your attention for a short time to the interests of the State from an agricultural standpoint. You gentlemen are here not only to represent the interests of agriculture, but to consider and devise means by which the agricultural interests of the State will be advanced; recognizing the fact that the State Board and the numerous Associations throughout the State that you here represent have done and are still doing a great work in that direction. But while you are doing so much to advance the agricultural interests of the State, is it not possible that you are overlooking (or partially so) a very important factor in the interest and welfare of the State. If I understand the object and aim of the agriculturist it is to feed and clothe the human family. These are the two fundamental objects. But there are so many things that are outgrowths of these two that we almost lose sight of the real object. I do not intend to say anything about clothing but confine myself to the food supply. Meat and bread are the staple articles of food, and the leading question of the day is how to produce the greatest amount of these and of the best quality. In the production of bread there is not the strife nor skill manifested that ought to be, for as soon as we exhaust the wheat producing elements from our soils we remove to other and newer fields and exhaust them, and so on. But in the production of animal food we pursue a somewhat different course, our breeders of fine stock are striving to produce animals of different kinds that will furnish the greatest amount and finest quality of meat from a given amount of food, and I think this has been accomplished to a great extent and is still improving.

But, Mr. President, we find that meats or the flesh of animals is not all the animal food that we can or do have, neither is it the cheapest or the best under all circumstances for we find many through our State, that do not nor can get or have meat a great portion of the year, the price takes it out of their reach and they must look for a substitute, for the human organization requires some animal food or we fail in health and strength to perform our part in the great struggle of life. We find, Mr. President, that in good pure milk we have a cheap animal food and one, and the only one, that has all of the elements that are required to build up and develop the physical organization. We also find according to our chemist's report on the nutritive qualities of milk, that one quart of milk is equal to one pound of boneless beef. We also find that one average cow will give from two to three thousand quarts of milk per year, or from four to six thousand pounds of milk, being from four to six times their own weights annually. This making an annual supply of from two to three thousand pounds of animal food per annum, and that without destroying the source from whence it came. And the cost of keeping will not exceed the cost of keeping a steer, whose dressed meat will not exceed seven hundred pounds, besides having to wait three years for the growth of the steer. These statements may be true say you, but we do not propose to be put upon a milk diet just yet. Neither do I, but that does not change the facts as to the relative value of the two substances for food purposes. But as we can use only a small portion of milk in its normal condition, let us concentrate it and get rid of the eighty-five per cent. of water that is in it, and have an article that has a good demand in all civilized nations, and which is a blessing to the poor and laboring man that can not afford to buy meat. I have reference to good honest cheese. Then there is the butter that none of us are willing to do without, comes from this same source. The produce of the cow is the poor man's blessing, and the rich man's delight, neither can do without her. And yet the place she with her produce occupies at our fairs, would lead us to conclude that she was only a necessary evil. But gentlemen the time has come when the dairy interests of Indiana ought to receive the attention that it deserves. It is a branch of agriculture that Indiana is well adapted to, and should have a large surplus to send abroad every year. But of dairy products we are buying thousands of dollars worth from neighboring States, while we have as good a State for dairy purposes as any State adjoining us, and instead of buying we ought to supply our home demand and send out a surplus of dairy goods nearly equal in dollars to the surplus of breadstuffs. Let me say in conclusion, that there should be inducements thrown out by all the agricultural associations throughout the State to encourage a competition for dairy goods manufactured in the State. Let the officers and delegates, and in fact all who have the welfare of the State at heart, lend a helping hand to raise this branch of industry to a level with other kindred branches of agriculture. When we look around and see what great results have been accomplished in this State by united effort on the part of those that have had the agricultural interests in hand, it is astonishing. And why it is that the dairy interest has been so neglected, while the other branches have made such rapid strides towards perfection, I can not conjecture.

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*A paper read before the State Board of Agriculture, January, 1882.

REPORTS

OF

County and District Agricultural Societies,

EMBRACING THE

CONDITION OF AGRICULTURE

FOR THE YEAR 1881.

FOLLOWED BY A CONDENSED FINANCIAL EXHIBIT AND NUMBER OF ENTRIES IN TABLE FORM OF ALL THE AGRICULTURAL SOCIETIES REPORTED, WITH A LIST OF THE NAMES AND ADDRESS OF THE PRINCIPAL OFFICERS OF EACH, AND

COMPARATIVE STATISTICS OF PRODUCTS IN INDIANA.

BLACKFORD COUNTY.

The fourth annual fair of the Blackford County A. H. and M. Association "showed up" as advertised, on the 20th day of September, 1881, tarried with us four days, and passed into history. While it did not "boom," particularly financially to such an extent as some other fairs of which we have some slight knowledge, yet I am happy to inform you that we are still "in the ring," a little "bruised," perhaps, from having had too great expectations. Hold our grit, however, and stand up to be counted among the "big" counties.

We determined while our fair was in progress that we would not invest any of our funds in government bonds or other stocks, as the season appeared to be a little "off," but succeeded handsomely in collecting a sufficient amount to pay all of our premiums in full, liquidate all current expenses, reduce our indebtedness a little, have a small balance on hand, and are correspondingly happy.

The showing in horses was good, both as to numbers and quality, and the way our people compete with each other in that department shows a disposition to improve the stock that is commendable. The mule does not appear to be a general favorite among our people, for reasons perhaps that are obvious, and the showing in that department, while not very extensive, was fair.

The association started out under the mistaken idea that the quickest way to pay off its indebtedness was to reduce the premiums, and while pursuing that line of policy, premiums on cattle was reduced to such an extent that the showing was almost an entire failure, exhibitors going to other fairs where larger premiums were offered. The money was what they were after, and that we did not know it is remarkable.

The many splendid varieties of sheep on exhibition is sufficient evidence that the business of wool growing with our farmers is to be the principal farm industry of the future.

The showing in hogs was large and satisfactory.

The activity and "push" of Hon. W. A. Bonham, Superintendent, in the poultry department made that, as usual, one of the most interesting features of the fair.

The agricultural and horticultural departments were well filled, and showed that those pursuits in the county were not neglected, and in good condition, while floral hall was well filled with the display of textile fabrics and fine arts.

The speed department was well represented and gave general satisfaction, although it did not "pan out" as handsomely as the "boys" anticipated. The effect of a "horse race" on our Hoosier population is remarkable, and I presume we are no exception. Old sentimentalists, who vigorously denounce horse racing in their sober moments, yet when the "scoring" commences are generally found under a "high pressure" standing amid a perfect jam in the front rank, discussing in an animated way the relative merits of the "flyers." In my last report I believe I stated that we had one of the most pleasant fair grounds, as well as the best half-mile track, in the State, and for that reason will not refer to that subject at present.

A new feature of offering special premiums by our business men was introduced and succeeded admirably, such as "Equestrianism," "Foot Race," "Wool Sack Race," "Wheelbarrow Race," and "Baby Show," giving general satisfaction with the exception of the "Baby Show," about which there was considerable grumbling among the ladies on account of the short time allowed for preparation. This, however, will be obtained in the future, as that department has become a permanent feature with our association. And if you, Mr. Secretary, will make us a friendly visit during our next fair, you will be surprised at the energy and activity of our people.

JOHN NOONAN, Secretary.

CASS COUNTY.

The ninth annual fair of the Cass County Agricultural Association was held at their fair grounds, at Logansport, September 20 to 24, 1881, and was satisfactory to both the association and exhibitors, although the attendance, which was fair, was not as good as it ought to have been.

There is no doubt but that persons make a great mistake by not attending their county fair, not only for the encouragement it gives to the association and exhibitors, but for the vast amount of information they might derive therefrom, such information that can not help but be of great benefit to all classes of our citizens.

The number of entries was 1,938--exceeding last year nearly 200—and was fairly distributed among the various classes—so that there was a good show in all the departments.

The amount of premiums awarded and paid was $2,628.94

There was nothing of especial interest occurred during the fair—but this much may be said, that the weather was fine, the attendance fair, exhibition good, the exhibitors, with a few exceptions, well satisfied; order, first-class, and all seemed profited by the holding of the fair.

The condition of agriculture in Cass county will compare favorably with any county in the Wabash valley, and it is generally admitted that the Wabash valley is as well adapted to agriculture as any portion of the State. There is a great diversity of soil in the county, and all susceptible of a high state of cultivation, and all the crops known to Indiana, it is believed can be raised here, and although Cass county has been in the background heretofore for several reasons, among which is the lack of good roads and a proper amount of drainage, it now looks as though both these obstacles would be overcome in a few years; there has been an immense amount of ditching done and tile put down in the last few years, which has made much of the land that has heretofore been worthless for agricultural purposes, the best producing land in the county. In the matter of good roads much interest is now being taken, and it looks like within the next few years we would make some rapid strides in that direction. Plenty of gravel is to be found in many localities in the county, and it is a shame that we have allowed other counties to outstrip us in the way of good roads.

Grain growing largely predominates; the crop of last year was only fair, but the large amount of grain sown and planted made the amount produced in the county nearly up to 1880.

Grazing and grass growing is largely on the increase, and is a profitable branch and is determined to encroach upon the grain growing branch. The amount of clover and timothy raised last year was fully up to the average, and was of excellent quality.

Fruit and vegetable crop was to a large extent a failure, especially the potato and cabbage, which were in many localities a complete failure.

Taking all the products of the soil together we have no great reason to complain.

D. W. Tomlinson, Secretary.

CLAY COUNTY.

Notwithstanding "block coal is king" in Clay county, agriculture is also an important topic. In the three hundred and sixty square miles of territory within the limits of this county, we have much of the finest and most fertile land in the State, which is well adapted to the successful growing of almost all the grains and grasses, the Eel river bottoms especially. Wheat and corn are the staples with farmers in this county, and few counties if any in the State can grow more per acre.

Our farmers are improving both their stock and mode of farming.

The horse is a favorite with Clay county farmers, the Hamiltonian, Norman and Clydesdale apparently in the lead.

The fourth annual fair of the association was held August 29, 1881, to September 3, inclusive, and while the entries were not so numerous as before in some departments, the articles entered were of superior quality. The horse show was better than ever before.

Our premiums were paid in full, and the stockholders were paid 20 per cent. premium on their stock, leaving a balance in the treasury and the society free from debt.

Our farmers are beginning to take interest in our annual exhibitions, vieing with each other as to who can best cultivate his grounds and improve his stock.

Labor saving machinery and the best of farm implements of the latest patterns are used quite extensively.

Our next annual fair will be held at our fair grounds, in the city of Brazil, beginning September 4, 1882, continuing six days, at which time and place we hope and expect to see the farmers of Clay and adjoining counties, with their products and stock, competing for the liberal premiums offered by our association.

E. C. KILMER, Secretary.

CLINTON COUNTY.

Clinton County Agricultural Society held their fair, commencing August 22 and ending August 26, 1881.

The extreme dry weather for two months previous, and the deepness of the dust, prevented a large attendance except on Thursday, which was unusually large. The stock show far exceeded any of previous years. On account of the early date of our fair, the exhibit in produce hall was somewhat slim, but the floral and mechanical halls were representative of almost every industry in the State, and showed much skill heretofore unknown. The speed ring was well represented by a number of fast horses.

Wheat and corn are the principal grains raised in the county, yet a considerable amount of flax, oats and barley was raised during the past year. Corn was not an average crop, but the wheat was more than an average crop. On account of the drought during the months of July, August and September the pasture was very short; but late in the fall and winter the pasture was very good. Stock is wintering in fine condition, the fall wheat never looked better, the apple and berry crop was small. Considerable drainage by the way of large ditches and tiling has been done. The farms are all well fenced, and but few stock is permitted to run at large. Some thirty-five miles of gravel roads is under process of construction. The Commissioners have let a contract for building a $175,000 court house which will be commenced in March next.

The Clinton County Agricultural Society will hold its fair August 28 to Sept. 1, 1882.

JOHN BAYLESS, Jr., Secretary.

DELAWARE COUNTY.

The Delaware County Joint Stock Agricultural and Mechanical Society held its twenty-ninth Annual Fair the second week in September, commencing on Tuesday the 13th. The exhibition in all the different classes was good, but owing to the inclement weather the crowd was not as large as in former years.

The fair grounds is situated one-half mile north of the City of Muncie and contains forty-one acres; fence, sheds, stalls or booths, shade trees, four wells of water, and everything calculated to make visitors and exhibitors comfortable during the fair. Muncie, the county seat of Delaware county, is situated in the bend of White river, has gas works in full operation, two large flouring mills, two machine shops, three carriage shops, one flax mill that works all of the flax straw within reach, besides what straw is shipped here from other counties. The tow is manufactured into what is called bagging.

ELKHART COUNTY.

In compliance with the statute requiring annual reports from each agricultural society, the following report for and on behalf of the Elkhart County Agricultural Society is submitted:

This society is not a stock company, as is most of the agricultural organizations of the State. All persons who are residents of the county, and purchase a ticket paying therefor at least one dollar, is for the year a member of the society, entitled to vote at the annual meeting and exercise all rights in relation to the business of the annual meeting, and eligible to any office of the society.

It is now thirty years since this society was organized, in which time the society has moved three times to new grounds, and being about to take title to the third fair grounds, it was deemed best to reorganize and place on record in the recorder's office new articles of association. This was done at the last annual meeting in January after the annual report, and since then the society newly organized has accepted a deed for the new fair ground that has been occupied by the society for seven years, but the title to which was in a stock association which had furnished the money to purchase same. So that since the last annual meeting the society has received a deed in fee simple for the fair grounds of twenty-seven acres, but to do so had to incur a debt of $800. money borrowed to make up the full purchase money, for which a mortgage was given to the persons who loaned that amount, and that debt remains unpaid, although it will be seen that the last fair yielded sufficient money over paying premiums and expenses to pay the debt; yet the overplus stands as the funds of the society until the meeting coming within the present month, when the society will determine whether to prolong the loan or pay it. If the loan is prolonged, then it is proposed with the money in the treasury to build a suitable exhibition hall, that may be attractive as well as useful.

The annual fair was held on the last days of September and first of October, 1881, was well advertised, but the weather was unfavorable, and in that way the receipts as well as the interest in the fair was not equal to the expectations of those having it in charge, but for all was of average interest and success. Our fairs are always well attended, and the management is, we claim, unexceptionable. All of an immoral character in the way of shows and games are excluded from the ground, and the exhibitions are each year growing in favor with the best people of the county.

There is a marked increase and improvement in the number and character of exhibits; the live stock that is shown each year is of great interest to farmers. There are several of our enterprizing farmers who have gone to much expense to bring into and breed in this county the best Norman and Clydesdale horses, the best short horn cattle, and the best breeds of hogs; and it is to be hoped that these public spirited men, while they are public benefactors, will be successful in making the stock raising business profitable.

The society now feels that the matter of its work is no longer a bare experiment, but that a sure and permanent foothold has been had that can not but do much to forward the agricultural interests of this county and elsewhere.

This society has been fortunate that all premiums offered and fairly awarded to exhibitors have been always fully paid; nor does it charge any price for entries save those for speed, and in charging for these it but conforms to the excepted rule everywhere; nor does it make any charge whatever for use of stables for stock or exhibit grounds to exhibitors. Also, it is a rule to always furnish free of charge motive power to agricultural machinery exhibitors, and this last is a very interesting feature of the fair as well as a useful one.

Now, in summing up, will admit that although by the reason of unfavorable weather our fair was not so grand a success as we had hoped, yet it was quite good, and in its results encouraging, evincing the fact that even with the unequal chance of bad surroundings we could be fairly successful. We expect better luck next year.

JOHN W. IRWIN, Secretary.

FRANKLIN COUNTY.

Annual report of the condition of the agricultural, etc., of Franklin county, Indiana.

For several causes, our society was about to abandon the holding of a fair in the year 1881, until about three weeks before the time of the exhibition, viz., September 20 to 23, inclusive, so that the whole was an impromptu affair. Considering the short notice and the sad public event of the week, our attendance was good, and our exhibition in many respects successful. Many of our old farmers when they had ascertained that they could attend, without running the risk of being "fleeced" by "sharpers," honored our fair with their presence. Our horse and cattle show was pronounced by connoisseurs to have been the finest ever exhibited in the county.

The condition of agriculture in our county is improving, though many of our older farmers are not paying much attention to scientific farming, yet the large majority of our young men are keeping pace with the strides of science, by informing themselves through agricultural papers and every other available means, of the best methods of improving the soil, preventing disease, refining stock, protecting fruit trees and economizing time and labor.

The wheat crop of the year fell short of that of last year; the straw was short, the quality of grain excellent. The corn crop was short in some places, yet there was enough of that cereal raised to fatten all the hogs and keep in constant operation a distillery, having a capacity of six hundred bushels per day. The prospect for fall-sown small grain was never better, and the acreage is unusually large.

Our farmers have learned from experience that it pays to keep good stock and take good care of it. The "Pennyroyals" and "Elm-peelers" are becoming a scarce article, and our live stock will compare very favorably with that of any surrounding counties.

Our supply of fine timber is fast disappearing. Much of it is sawed by our own mills, and still greater quantities of poplar and walnut are shipped in the log.

Our supply of excellent limestone for building purposes is inexhaustible. The entire northwestern portion of the county is one continuous quarry, and most of it can be quarried without very much "stripping."

There is, however, one influence, which is wielding its strong arm in favor of improvement in agriculture, yet it is overlooked by many. Our public schools instead of teaching our boys to "do sums" and "spell down the school," as was formerly the practice, are teaching them to *think*. The school boy of to-day wants to know the reason for everything he does, and by doing this, he increases his capacity for thinking. He takes pleasure in tracing causes and studying their effects. He acquires knowledge, and finds a ready application for it on the farm. He learns that the scholar has a mission to fill on the farm. He learns that the intelligent farmer is as honorable in the pursuit of his calling as the man of any other profession. He has no desire to leave the farm to find something more interesting to do. By educating himself he places agricultural labor on a level with every other educated industrial pursuit. It is, therefore, in a great measure the work of our public schools to elevate this useful branch of industry, and our farmers should weigh this point well when they keep their boys out of school with the pretext of needing them for work.

M. A. MESS, Secretary.

FULTON COUNTY.

The Fulton County Joint Stock Agricultural and Mechanical Society is in a very fair condition—had a very fair exhibition in September of this year. The drouth in July and August cut off our supplies for a great display of agricultural products. The Horticultural Department was light, but we had a very fine collection of fruit for this season, as far as I can learn no other county in the State had any better. Corn on what was usually called wet land, but recently drained by open ditches and under-draining was a large yield, but the upland, clay and sandy soil was cut short by dry weather, cutting down the average as near as I can learn to about thirty bushels per acre. Oats was a fair crop making about thirty to thirty-five bushels to the acre.

Wheat was only about a half crop compared with three or four former seasons, the average was about twelve bushels per acre. Grazing in the greater portion of the county is very good, especially in the south and west, and getting better every year as the county gets older and the tiling interest increases. We have one extensive tile factory three miles from the county seat and one across the line in Miami county that supplies a great many tile for this county. In traveling over the county you will see piles of them on farms that for years was thought to be dry enough without draining. There is quite an interest taken in the county in raising and the improvement of stock of all kind, which is in good condition and free from disease; but will say in this connection that it is thought that hay and roughness of all kind will be scarce before another crop is raised.

The county is improving rapidly in every branch of industry. The building interest is increasing gradually, large and commodious houses and barns are being built all over the county.

The Chicago & Atlantic Railroad is nearing completion through the county, making about thirty miles more improvement in that direction and better facilities for the farmers and stock raisers to get their produce to market with cheaper freights. The prospects for a good yield of wheat for 1882 is much better now than two months ago, fields that were injured by the fly is stooling nicely and recovering from the ravages of these insects.

WM. H. C. CHINN, Secretary.

GIBSON COUNTY.

The twenty-seventh annual fair of the Gibson County Horticultural and Agricultural Society was held on the 19th and 23d of September, 1881, and was a success in spite of the forebodings of failure which was often heard by those who had the duty of making the arrangements for the coming fair. Many thought that it would be impossible to hold a successful fair, on account of the long protracted drouth which this county had been suffering from, and which cut the corn crop very short; and reports were being received from various parts of the country of fairs being postponed, while others were being held with but little success. But before the date of our fair we were blessed with a copious rain which laid the dust, made our prospects brighter, and the fair passed off with the following result:

Number of entries	1,281
Total receipts	$3,414 10
Total expenditures	2,743 98
Balance on hand	670 02

This fair was conducted on the usual plan of this society. No entry fees (except in speed rings); no shows or gambling devices of any kind being allowed on the grounds, and no pains are spared to make it a very pleasant affair, both to exhibitors and visitors.

On the morning of the second day of our fair the news was received of the death of James A. Garfield, President of the Nation. The Board of Directors being in session, it was ordered that a committee on resolutions be appointed, and that all ring exercises be dispensed with for the day. The committee on resolutions made their report, which was adopted by an unanimous vote.

RESOLUTIONS.

WHEREAS, It has pleased God, in His providence, to remove by death General James A. Garfield, President of the United States; therefore

Resolved, That while we bow in humble submission to His divine will, we express our feeling of regret at the untimely removal of our beloved President, stricken down by the hand of an assassin, in the day of his usefulness.

Resolved, That while we feel that the country had met with an almost irreparable loss in the death of our beloved President, yet we trust that the same Providence which has heretofore watched over and guided us and our country safely through other times of trial, will carry us through this similar ordeal.

Resolved, That we suspend for this day all ring performances, and all business except such as is absolutely necessary under the circumstances.

Resolved, That suitable decorations be made upon the society's buildings; and that posters containing these resolutions be posted up; and that copies be furnished each of the county papers for publication.

[Signed]

JASPER DAVIDSON,
ROBERT MITCHELL,
C. C. MILES.
W. L. WOODS,
WM. M. COCKRUN,
R. M. MUNFORD,
Committee.

While the entries in some of the classes were not up to former years, yet the exhibit was very good, and it was conceded by all that the fair was a success, and it will long be remembered with pride by those on whose efforts so largely depended its success.

Of the condition of agriculture in this county but little can be said without a repetition of former reports.

There is a steady advance in agricultural pursuits. Our farmers are becoming more acquainted with the importance of being educated up to all the recent improvements, not only in the matter of improved machinery and farm implements, but in the modes of cultivation and improved breeds of stock.

The present prospect is good for the next crop of wheat, which is the principal crop in this county.

The corn crop of this year was a partial failure, on account of the severe drouth and poor seed. Yet if our farmers learn by it the necessity of securing good seed, and putting in the crop at the right time, and in the proper manner, it may prove a blessing in disguise to them.

Our farmers have buildings, both residences and barns, which will compare favorably with those of any county in the southern part of the State.

There is a large increase in the amount of tiling made and used in this county in the past year, and with satisfactory results in almost every case.

While some of the farmers are building plank and wire fences, the old fashioned rail fences largely predominate in this county.

There is no improvement in the roads, or the manner of working them, as yet in this county. What effect the new laws on that subject will have remains to be proven, and we hopefully await the time of their action, having abundant assurance that they can not make the roads any worse.

JOSEPH C. HARTEN, Secretary.

GRANT COUNTY.

The Grant County Agricultural and Stock Association held its twenty-eighth annual fair on its grounds one-half mile east of Marion, on the 7th, 8th, 9th and 10th days of September, 1881.

Our grounds belong to the Association in fee simple. A thirty-five acre lot lying one-half mile east of Marion on the Marion & Eastern Gravel Road, with living water on three sides, and shade trees of almost every forest variety, nicely interspersed over the entire lot furnishing shade for man and beast. Our speed ring of one-half-mile is situated on a plane elevated forty feet above the surrounding spring branches.

We have an amphitheater capable of holding 2,000 people. Agricultural and Floral Halls of ample dimensions. Stock pens, stalls, etc.

The show of horses, cattle and sheep was equal to any former exhibition. Our hog and poultry departments not so full as last year. Our grain and vegetable show was also good, and it would not be just to our ladies if we did not state their department was fully equal to any other, and fully equal to any former year.

We have had a little feeling in our speed ring exercises for two or three years. This season the Board published the rules and regulations for that exercise, and adhered to them, which had a good effect. We have found that the closer printed rules and regulations are adhered to the better.

Our county has been happily situated in the great corn belt the past season. The severe freezing the past winter rendered our grounds in excellent condition for spring crop, and while we had comparatively a dry season we had a first-class corn crop, which is now being marketed by the thousands of bushels at from fifty to sixty cents.

Farming in this county is in a flourishing condition. There has been an immense amount of ditching done in our county during the past few years. Tile drainage has been reduced to a success and has become to be almost an every day business among our farmers.

Our fair, financially, has been a success. We paid all our premiums in full, as usual, all expenses for repairs, etc., and had $600 to apply on a deferred payment on our land.

David S. Hogin, Secretary.

GREENE COUNTY.

The Greene County Agricultural Society held their twelfth annual fair on their grounds at Linton, October 3d to 7th.

Never since the organization of the society was the prospect for a good fair better than this year. However the excessive wet weather the week before, and two days at the commencement of the fair, with a heavy rain the last day, made it financially almost a failure. Many exhibitors that were on the road turned back, while others did not leave home, expecting to be too late to make entries; still the exhibit was larger, under the circumstances, than we could have looked for, but the attendance was small, owing to the bad roads and inundations of part of the grounds, the water not receding till Thursday of the fair.

The society built eighty rods of new fence and fifty new stalls of good material, an improvement needed, which had to be paid for before the premiums were adjusted. Hence, after all expenses were paid we had to pro rate the premiums. Paying only a per cent. on awards made, is a drawback on agricultural fairs, and should be avoided if possible, even if the premiums offered have to be reduced.

During the last two years we surrounded our grounds with a good substantial new fence and built a sufficient number of new stalls for horses and cattle. Our extraordinary expenses will hereafter be light; the board will, therefore, offer their next premium list "to be paid in full."

The continued dry weather of the past season had a bad effect on our crops. Fly and chinchbug have, however, done more injury to our wheat and corn crop than the drouth. The oats and meadow product was fair, summer pasture shorter than ever known, while fall pasture has been very fine. The yield of potatoes in most places has been reduced to a minimun through the prevalence of potato bugs, while the fruit crop was light and of indifferent quality. Wet weather has injured our stock fields, and high water ruined much good corn in the river bottom. Winter wheat, now growing, looks splendid.

Tile drained land has given this year fine returns in wheat and corn, and the time is near at hand when all our low lands will be underdrained, giving us a permanently increased yield that soon will pay for the expenses of the improvements.

P. Schultz, Secretary.

HAMILTON COUNTY.

The past year has been one of unusual prosperity in this county. The yield of crops was not as good as in former years, but prices were better perhaps than ever before, making money plenty, wages good, people contented and happy.

Many large and substantial barns, with neat and tasty residences, have been built the past season. Owing to the financial depression a few years ago, a great many farms were covered with mortgages, most of which are being satisfactorily adjusted.

We have recently built a very fine court house and jail, at a cost of nearly two hundred thousand dollars. In addition to the one railroad we now have, there are two in process of construction, one east and west, the other north and south, which will give us much additional advantage for shipping.

Many of our leading roads have been graveled, and mostly owned by stock companies, though quite a number of free gravel road companies have been orgrnized.

Our farmers practice mixed husbandry generally, with a systematic rotation of crops. They are beginning to find out that success does not so much depend on the number of acres as the methods of cultivation. The raising of corn and hogs is, perhaps, the leading industry at this time.

Very little commercial fertilizers have ever been used in this county; more care is taken to utilize the stable and barnyard manure than heretofore. Clover is the great staple fertilizer; it not only recuperates the soil, but proves very remunerative for pasture, seed and hay. With plenty of clover and tile drainage, the hidden treasure of our fertile soil may be developed.

Dairying has been practiced very little; one cheese factory and two or three dairymen shipping their milk to Indianapolis is about the extent.

OUR SOCIETY.

The Hamilton County Agricultural and Fair Association held its third annual exhibition September 13th to 16th, on its beautiful grounds one-half mile west of Noblesville. It is situated on an elevation between White river and Cicero creek, with Noblesville and Eagletown gravel road on the north, and the C., I. & St. L.

R. R. on the south. The grounds are well shaded, with plenty of water, and a splendid half-mile track, with a commodious amphitheatre. There is the usual number of halls, stalls and pens.

The various departments for exhibition were well filled. Additional stalls had to be erected to accommodate the large entry of horses, the classes were well filled in this department and competition lively. More interest was taken in jacks this year; seven good animals were on exhibition, some of them very good ones. The Short Horn show was very creditable, we had three herds all belonging to this county. The herd of Ezra Swain and that of Tomlinson and Cox were made up of some of the most fashionable strains of blood and color, it was very encouraging as this branch of industry has been very much neglected in this county. The show of Jerseys was better than formerly, and considerable rivalry; heretofore we only had one exhibitor in that class. The show of hogs, owing to the scarcity of corn and the prevalence of the cholera at that time, was not as good as the year before. Sheep very good.

The poultry exhibition was splendid and attracted many visitors. We secured the services of Mr. Pottage, of Indianapolis, as judge which gave general satisfaction. The display of farm machinery was in keeping with the other departments, threshers and self-binders were operated with steam power which was quite an attraction.

Fine Art and Agricultural Halls were crowded to their full capacity.

Especial mention should be made of the show of corn, a part of which made such a grand display at the State Fair.

The wisdom of the Board in giving large premiums on useful articles produced by a large per cent. of the people, was fully demonstrated by the show of corn, wheat, butter, calico dresses, rag carpets, etc., etc.

All games of chance, wheels of fortune as well as intoxicating liquors are rigorously excluded from the grounds, consequently the very best of order is preserved. Had it not rained all day on Thursday, (our best day) and no receipts received at the gate, our most sanguine expectations would have been fully realized, as it was we paid our premiums in full and $400 on improvements and indebtedness.

S. M. Smith, President.

HARRISON COUNTY.

The twenty-second annual fair of the Harrison County Agricultural Society was held at their grounds, adjoining the town of Corydon, commencing the 5th and ending the 9th of September, 1881.

The fair was considered a great success over the year 1880, with the advantage that year of one of the most productive seasons we have had for years, while for the year 1881 we had one of the most protracted drouths that we have experienced for thirty years perhaps.

The show of horses, from the light harness and saddle horse to the heaviest Norman draft horse, was a great success over the year 1880 in number exhibited, in condition and perfection.

The show of cattle was exceedingly good. There were three distinct breeds exhibited, the Short Horns, the Jerseys and Devonshires, together with some of our improved native stock, making an exhibition creditable to any county association in the State.

The exhibition of swine was never better, especially the two popular breeds with us, the Berkshire and Poland China.

The show of sheep was a very creditable exhibition, and showed a very marked improvement over former exhibitions, and we believe that the farmers have taken greater pains in improving that class of stock than any other.

The exhibition of poultry exceeded any former show that we have had, and was thought to be very creditable to the exhibitors.

Floral hall was as usual the center of attraction, there being no perceptible falling off, which was the case in the vegetable and fruit line. The qualities were as good perhaps, but the amount exhibited was less than we have had some seasons on account of the effects of the drouth.

The grain and seed exhibition was very good, especially in that of corn. The visitors seemed astonished at the amount and fine quality on exhibition.

The exhibition of machinery and agricultural implements, while it was good, was not what it ought to have been, and the failure in that particular was for the want of better transportation facilities; but with the Louisville, New Albany & St. Louis Air Line Railroad running east and west through the northern border of our county, and the present favorable prospect of a branch road from the main line to Corydon, these difficulties will be greatly overcome; and while our farmers have made marked improvement the last few years in their mode of farming, they will, we think, be stimulated to make still greater exertion in improving their farms and increasing the material wealth of this part of the State. They are reading more agricultural papers than ever before; they talk more agriculture than they used to, discussing the propriety and advantage of having better roads, less fencing, and the advantage of turning under more green crops for the improvement of their lands, a principle that ought to be stimulated by every society in the State, and one that ought to be encouraged more by the discussion of it in our agricultural papers. It is impossible for the farmers living away from our towns and cities to depend upon the stable manures for the improvement of their lands, and the use of the different artificial fertilizers are of doubtful propriety, except it be used on worn lands for the purpose of growing a green crop to be turned under.

There is another matter that ought to be brought to the attention of our industrious, enterprising young farmers just starting in life, and that is the impropriety of going west, or into other States or Territories, for the purpose of obtaining cheaper lands. There is not a neighborhood in the State perhaps but what has its shiftless farmers, that have allowed their lands to so run down that they can be bought for less than the improvements are worth; and with the advantage of good markets they can bring these farms up and get them to produce a better quality of grain than the virgin soil did, and much cheaper than to go into the woods and open a farm and building improvements. We are losing a class of young men that we can not afford to spare; better encourage them to buy out those shiftless fellows and let them emigrate to a country better adapted to their nature.

There are other matters of interest that might be alluded to, but the want of space forbids it, except to say that the agricultural interests of our State will advance in proportion to our education and knowledge of agriculture.

The main exhibition days of our fair were very interesting, especially that of Thursday, as it was the day set apart for the Old Settlers' meeting, who were well entertained by an able speech from Gov. Porter, who gave quite a detailed history of the early settling of this part of our State.

The society is in a very healthy financial condition, as will be seen in the following statement:

Amount on hand at beginning of the year		$682 38
Received from all sources		2,216 05
		$2,898 43
Disbursed for permanent improvements	$740 42	
Expenses running the fair	500 90	
Paid out in premiums	1,104 45	
Paid taxes	30 38	
		2,376 15
Leaving a balance on hand November 28, 1881		$522 28

C. H. HUDSON, Secretary.

HENRY COUNTY.

Farming in Henry county is principally grain growing. Corn and wheat largely predominating. Very small amount of grazing as a specialty. Fruit growing limited except as to apples and grapes, of which we have very fine varieties. The acreage of corn larger in 1881 than in 1880, the yield about two thirds of a crop in 1881. Wheat less acreage in 1881 than in 1880, yield about one-third. Hogs and wheat are the products on which the farmer relies principally.

The improvements have been very great in the past two or three years in the way of buildings and fencing. Tile ditching is being carried on as fast as the material can be procured. Fencing principally rail with considerable wire and board. Timber getting scarce, but being carefully husbanded. All the principal roads in the county are toll-piked. Mud roads in very good condition. Henry County is becoming famous for her fine horses, cattle and hogs. Not so much attention given to sheep raising. I think the present dog law a good one, as we will get all the tax on them, or get rid of them. Heretofore I don't think more than half of them have contributed toward paying for the sheep they have helped to kill. Our county is not flat land like a great many counties, still we find that under-draining is of great advantage to almost any kind of land. I would recommend large size tiling in order to get the water off the ground as soon as possible. Our fair last year was quite a success, although the second under the present control, the old company having failed and the grounds sold under execution, which created a large amount of bad feeling and predjudice at the time. At the last fair we paid all our premiums and have money for improvements in the treasury.

WM. W. COTTERAL, Secretary.

HOWARD COUNTY.

The fifth annual fair of the Howard County Joint Stock Agricultural Association was held at Kokomo, Indiana, on September 12th to 17th inclusive. The fair was a failure owing to several unfavorable circumstances, the two principal ones being the extremely unfavorable weather, and the great Soldier's Reunion which was held only ten days prior to the fair. To the Reunion people came by thousands, and naturally enough they were not ready for another big gathering in so short a time. The Board of Directors foresaw the failure and took on a careless spirit, so that the Secretary even is compelled to say the fair was an absolute and teetotal failure. The total receipts were only $1,130.20 as against more than $2,000 at all previous fairs. The amount offered for premiums was over $1,500; the expenses were $700, after paying which there was only enough funds left on hand to pay 33⅓ per cent. of the premium. But the failure of the fair in no sense shows the condition of agriculture in Howard county. We had an abundant harvest and bountiful crops of all kinds. No county in the State had better corn, nor did this county ever have a better crop in previous years. We have several herds of fine cattle, several breeders and dealers in fine hogs and sheep, and several first-class horses. But notwithstanding everything was plentiful, and the harvests abundant, the exhibit at the fair was very meagre. As we before said this was principally owing to the rainy and disagreeable weather. We believe with the magnificent resources of Howard county—with the energy of her people—with the snap and spirit of Kokomo, with her railroads, telegraphs, telephones, gas works, electric light and three of the best papers in the State, that the people will rally to the support of the fair, and that next year our success will be assured. Already a great interest is being manifested on the part of the ladies in favor of the next fair which is surely a good omen.

The prospects for crops next year are very fine, the wheat never looked better at this season of the year, and farmers and everybody are in fine spirits. Many mortgages have been canceled, many debts liquidated, many ditches cut, many large barns built, many orchards set out, many spacious brick and frame residences constructed, and we are a prosperous and happy people. Let all who read this report come or send a friend to our next fair.

A. N. GRANT, Secretary.

HUNTINGTON COUNTY.

The thirteenth annual fair of Huntington County Agricultural Society was held on their grounds adjoining the city of Huntington, commencing Wednesday, September 21st, and continuing four days.

The weather was all that could be desired, except on the third day, which was dry and windy, making it very disagreeable to many on account of the huge clouds of dust flying through the air. The attendance was very large, larger than probably ever before.

Our association excludes all gambling and its kindred practices within its enclosure. Nothing is tolerated which need offend the moral citizens.

Our grounds are owned by the county and improved by the society, which we think is one of the best county fair grounds in the State. Our track for speed is a very good one, being an oblong of one-half mile.

The attendance of horses were of a better quality and more numerous than ever before, there being two hundred and thirty-six entries made, and our stalls were more than full.

The exhibition of cattle was very fine, but not so large as at some previous seasons.

The exhibition of sheep and poultry was simply immense, both in quality and numbers, there being two herds of sheep just imported from Canada, as well as a large number belonging to our own county.

Our hog show was not so large as upon some former occasions, although good.

The display of agricultural implements was very large, and the exhibitors have the thanks of the officers of the society for the interest they manifest in its welfare.

The display in the floral and mechanical halls was very good, many of our business men having contributed largely. Fine arts and ladies' work were mostly monopolized by the ladies. The show was really good and proves a steady advancement in design and workmanship.

The condition of agriculture in our county is gradually improving, and the science of farming is becoming better understood. Our lands are being rapidly underdrained, which pays far better than ony other improvement upon the farm.

Our county has been and is taking a great boom in gravel roads. There is quite a number of them already finished and others commenced, and still others in contemplation, so at a very early date our county will rank, in respect to roads, with any other county in the State.

The crops of 1881 has been more than an average. The wheat, flax and oats was fair, many fields of wheat extra good. Corn we think will rank with any other county in the State, there being a large yield and of an excellent quality. Although we have numbers of fat hogs to export, our grain shippers have been shipping thousands of bushels of corn eastward, which has not been the case for some four or five years.

GEO. WHITMORE, Secretary.

JACKSON COUNTY.

The sixth annual fair of the Jackson County Agricultural Society was held at Brownstown, August 29 to September 2, inclusive, 1881.

The weather was fine the last three days and the attendance was good. The third day, as on previous years, was devoted to the old settlers of the county, which has proven to be a very interesting feature of our fair.

Floral hall was well filled and successfully managed by a committee of ladies.

The live stock department was well filled, except hogs. The show of horses and sheep surpassed any previous fair. Cattle department was not so well represented as on previous years, but a better quality, principally short horns.

The fair was a success financially.

CONDITION OF AGRICULTURE.

The agricultural interests of this county are in a good shape.

We have made considerable improvements the past year in the way of barns and shelter for stock. There has also been erected two large flouring mills, which have proven a great benefit to the farmers and profitable to the owners.

The county has built four good substantial bridges the past year, which, with the graveling of much of the public highway, has greatly improved our roads.

The yield of all the products of this county was fully one-third less than last year, except melons. The melon crop was better than for several years, and the price good. It is estimated that the watermelon crop alone brought into our county $85,000.

There has been considerable draining of wet land the past year and has given satisfaction.

I think the benefits derived from the statistical reports are sufficient to warrant the continuance of them. There seems to be a greater desire to give correct reports.

The time is not far distant, before the farmers in this locality will have to fence stock in instead of out, owing to the scarcity and cost of timber.

A new and interesting feature of our fair was an educational exhibit made by the teachers of the county.

JOEL H. MATLOCK, Secretary.

JASPER COUNTY.

Our fair for 1881 was held on the 13th to 17th days of September, inclusive. The managers and stockholders of the Jasper County Agricultural Society have no special cause of complaint of the result, when viewed from a financial post of observation. It will be remembered that a long drouth was a feature of the summer, and as a matter of course the vegetable crop was a light one, and the principal kinds of fruit were cut short. Pastures, too, were scorched and withered until they looked little better than stubble fields, so that cattle were gaunted up about that time. People had then no fruit and few vegetables that they thought fit to exhibit, and their stock was not in the condition usually admired in animals for show. But the officers of the society were determined to make the best of the situation, and, if possible, avoid an utter failure, and as an unusual inducement to fill the exhibition space, they caused it to be announced that the usual ten per cent. fee charged exhibitors would be abolished in all departments, except those devoted to live stock and the speed ring. They also increased the premiums offered upon poultry, sheep, hogs, manufactured articles, farm and garden produce, and the preparations of the housewife. As a result, there was an extraordinary and highly attractive display in the halls. The ladies covered all the space allotted to them with needle work, dairy products and culinary preparations.

There were also splendid garden and field specimens, fine potatoes, onions, squashes, beans, small grains, and enormous well ripened ears of Indian corn in profusion.

Of fruits, the samples were few, but choice in quality and quite perfect.

Few manufactured goods were shown.

There was no attempt at a floral display.

A few meritorious farm implements were exhibited.

The display of miscellaneous articles for diplomas was larger than usual.

In the pens and stalls were a few good sheep, hogs, cattle and horses—nothing near as many as had been seen on the grounds at former fairs.

The poultry show was the best that we have ever had, and there have been good ones before. It was large, varied and attractive.

The speed ring showed up well, notwithstanding the fact that a reduction of nearly thirty per cent. had been made on the purses as compared with those advertised the preceding season.

In the midst of the holding of the fair was a rainy day. This was Thursday, which ought to have been one of the best financial days. The morning dawned on ground saturated, and rain fell with scarcely any intermission until sunset. Of course nothing could be showed out of doors; and of course no visitors attended. The fair was adjourned over, and the programme was extended to include Saturday, but the mischief could not be wholly repaired. Notwithstanding the unfavorable conditions related, enough money was taken at the gate and collected from the rental of space to pay in full the premiums awarded, and to liquidate all but about one hundred dollars of the claims against the society. *Nil desperandum* is our motto, and the society will hold another fair at the same old stand in 1882.

CONDITION OF AGRICULTURE.

Large herds of cattle are less frequently met in this county than in earlier days. I do not mean that fewer cattle are bred and fed here, but they are scattered around more generally, not kept together in such large bunches, as in the days before the county was so thickly inhabited, and before so much of the land was enclosed by fences. The breed has been greatly improved by separation, better care, better feed, and the introduction of improved blood. The improvement has, however, been altogether in the direction of beef making. There are few, if any, good milkers or butter producers to be found in our pastures. Some day this condition may be modified, and more attention directed to the profits to be found in the dairy. Next to cattle raising in importance in Jasper county has been the growing of Indian corn. It is a question to-day if the latter is not even in the balance. The corn crop of 1881 was excellent, it was fully ripened, had been well cultivated, and the yield was satisfactory. The prices realized for it have fluctuated between forty-nine cents and sixty cents a bushel, the average being about fifty-three cents at the railroad cribs. Oats were a good crop, so were wheat and flax. Potatoes and all garden truck were made short by the drouth. There was no fruit worth speaking of. In no former year was there so much good hay, both cultivated and wild, put into stack. Tons by the thousands was not even moistened by the dew. It has commanded satisfatory prices. Next to corn and not much behind either, is the hay in importance with us. Much of it is fed on the ground, but there is also an important industry in baling and shipping it, which has sprung up within a few years. After cattle, hay and corn, come hogs in point of importance. Our breeds are Berkshire, Poland-China and Jersey Red with decided preference for the first named—either pure breed, or crossed, or common stock. The sheep industry is not given very much attention. There are a few small flocks, occasionally there is a thoroughbred; but most are common natives, or those of mingled blood, with the preference manifested for long wool and more mutton. Our horses are chiefly what may be properly called general purpose animals. That is to say, they answer reasonably well for the saddle, the carriage, the road, the farm, all combined about equally, nothing really prominent. The tendency is decidedly in favor of Norman crosses upon the common scrub. However a few flyers are owned in the county, some of which are known to the race courses of three or four States, and boast genealogies recorded in the stud book.

A decided change for the better is perceivable each succeeding year in the method which farmers employ for the tilling of their soil and the cultivation of crops. The land is better and more systematically worked than formerly. There is a manifest desire to learn and adopt improvements. There is a growing taste for literature treating upon farm topics. In brief there seems to be more mind work combined with hand work. Several tile factories are finding employment in the solution of the problem of systematic draining. A butter factory or creamery of the capacity of 1,000 pounds of No. 1 butter daily, has lately been built at the county seat, which is doing a good paying business, while opening a new field to the vision of stock breeders. Poultry raising is also commanding respectful attention. Orchards and vineyards are being planted, and, what is more to the purpose, they are being cared for with a thought to their ultimate value as a source of revenue.

HORACE E. JAMES, Secretary.

JAY COUNTY.

The Jay County Agricultural Society held its tenth annual fair at their grounds, near Portland, on October 4th, 5th, 6th, 7th and 8th, 1881.

Our fair was a financial success. Our receipts with balances on hands was $3,267.76; our expenditures for the year was $2,330.11, leaving a balance on hands of $937.65, which we feel is a very satisfactory result and will undoubtedly cause us to increase our premium list for the year 1882.

THE CONDITION OF AGRICULTURE.

Our county is well adapted to all kinds of small grains, we raise barley, oats, corn, wheat and rye, and in fact everything of like nature that finds a foothold in the State of Indiana. Our soil is clay and loam; the loam predominates, however. Our farmers are awakening to the importance of under-draining, our tile men find the demand for tile greater than their most sanguine expectation.

FRUIT.

Our locality suffered greatly from last winter's cold, we find orchard after orchard that 75 per cent. of the trees are dead or in condition to bloom no more.

HAY.

Our farmers are paying more attention to their meadows, the result, an abundant hay crop.

CATTLE.

In this line we are improving rapidly. Mr. R. T. Hammons and John Williams are most prominent in this line, and are stocking their farms with a good class of cattle that would do credit to any county in the State.

HOGS.

There is a lively interest in this class of stock. The Poland China breed predominates.

SHEEP.

Our farmers are giving this important factor to their wealth a fair chance. We have within our county limits some very fine herds of both long and short wools.

FENCING.

Our fencing is largely rail. Some of our farmers are replacing their old rail fences with hedge and boards.

BUILDINGS.

Our farmers are realizing the importance of good shelter for man and beast, and as a result the old log structures are giving place to brick and frame.

ROADS.

In this line we have made great improvement in the last two years. We have built 45 miles of gravel road and have now in course of construction 36 miles which will be completed in 1882.

GEO. W. MILLER, Secretary.

JEFFERSON COUNTY.

The Jefferson County Agricultural Association, on account of the excessive drouth, as well as some other minor causes, failed this year to hold its annual exhibition.

To the agricultural community the past has been a very disastrous season, crops of all kinds failing to remunerate the farmers.

During the fall of 1880 a larger quantity of fertilizer, bone dust, was used in this locality than ever before, the ground prepared with greater care, and upon all land where possible the grain and fertilizing material were sown with the most improved machinery. The spring opened favorably, but found a large proportion of the grain so winter killed that a large acreage so sown was prepared for corn, which was planted generally in good season.

Upon hill lands bordering upon the river, where planted early, the corn was a good half crop, but in most of the county it was very poor, and in some portions an entire failure. Hay and oats were probably half crop.

During July and August no rain came upon the parched earth, and the fall found the husbandman gloomy in the extreme. Rain came in time, however, to start the pastures for fall grazing, and succeeding auspicious weather lightened the burden of the farmer by providing grass in abundance for his stock; and as yet—Prof. Vennor to the contrary—has not found it necessary to draw upon his slender store of provender for his animals' maintenance.

Tobacco is fast becoming popular as a crop in the eastern and southeastern portions of the county, there having been at least five hundred acres planted. The crop in common with all others suffered from the drouth, producing not more than one-half crop. Until within the past three years none of any consequence was grown in this locality upon this side of the Ohio, the land not being considered adapted to its growth. The fallacy of this has been demonstrated, and succeeding years will show increased acreage planted.

There seems to be no predominating kind of farming in this county. All the cereals grown are distributed in accordance with the adaptability of the soil. Upon the hill farms corn, wheat, barley and tobacco; the uplands wheat and grass for hay, although every farmer endeavors to raise corn enough for his immediate uses. It would be hardly interesting reading to compare the ratio of *decrease* of production with previous years.

Improvements both in buildings, fencing and draining are perceptible throughout the county, as well as improvement in the ways of husbandry. Orchards receive their proportion of attention, and the smaller fruits, raspberries and strawberries, are cultivated to considerable extent.

The county has greatly improved during the past decade in its roads, but a great diversity of opinion exists in regard to the effect the law enacted by the Legislature will have upon them in the future. In a paper like this it is scarcely within the province to discuss.

A "stock law" prevails in some of the townships requiring each farmer to fence against his own stock; in other words, stock is not permitted to run at large save at owner's risk. A general law throughout the State prohibiting animals from running at large would result in the saving of millions of dollars to the farming community in the matter of fencing.

In regard to the dog law. If carried out to the letter the new one must certainly prove beneficial. Under the old law in this county—and it is presumable so in all counties—not one half of the dogs are assessed upon the tax duplicate. Where the fault lies must be pronounced in some other manner than this.

GAM. S. TAYLOR, Secretary.

KNOX COUNTY.

The statistics embraced in this report in the table form fail to present anything like a truthful picture of our steady progress towards a superior system of Agriculture. No arrangement of figures can convey the impression that our recent exhibition fixed upon the mind of the observer familiar with a portion of the past, that the "Art forstering all Arts"—the cultivation of the soil is rapidly advancing in this county. The alluvial character of the soil with its inexhaustible fertility has served for a long period of time to stimulate (excuse a paradox) our farmers to a system of lazy farming by which our crop-products were long kept below many neighboring districts not so circumstanced.

In comparing our present exhibits with our sister counties it must not be forgotten that our acreage includes many plantations that have been under cultivation for a century while the comparison is made with nearly virgin soil. And such cultivation as our bountiful lands received during that period; rotation of crops, clover-fertilizing, or sub-soiling were unheard of for seventy-five years of the time, and for the next decade were denounced and denied as "book farming." The history of real agriculture in this county is all comprised in the past fifteen years. Up to that time farming consisted in snatching now and then a crop of corn from the overflowing rivers, to fatten the hogs not devoured by cholera, the stacking of a few tons of wild grass in the unfenced prairies, and the "luck" of producing "bread and seed wheat" on the undrained "second bottom." Canadian-pony blood pervaded all horse stock which "roughed it" through the wet cold winters upon such provender as it could fish out of miry swamps.

Diminutive horned cattle, unhoused, wintered on the wild hay, with an occasional treat of "cut-up-fodder stalks." Barns for storing grain and hay, sheds for cattle, horses and farming implements were like agricultural Journals among our farmers—few to be found to the square league. In those days no place was so desolate as the granary of an average farmer. Our annual exhibitions brought together many things that had attached to them all the interest of articles in a museum. Here would be found a sheep weighing twelve or fifteen pounds; then a shoat whose rounded hams more than compensated for his shortened jowl; a brood-mare and her foal, bright and shiny with care. Now all this is changed and never was the change more apparent than at our last exhibition. Our herds of sheep and cattle, studs of blooded horses, the show of splendid healthy, blooded swine and poultry, the improved quantity and quality of cereals, farm products, fruits, flowers, etc.. were no longer curiosities, articles in a rare show; they were truly representative of a boundless improvement in the manner and mode of farming. Art and the domestic manufactures testified equally to our advancement. The "ten yards of jeans" and "five yards of tow linen" that used to hold a conspicuous place with the "patch work" quilt, and constituted with that last ubiquitous articles the bulk of the display of the handi-work of our wives and daughters had the gracious company of the most delicate, refined and beautiful fabrics created at the fireside of our farmer homes.

A system of levies has thrown the rivers off the low lands tiling has reclaimed the swamps, rotating crops, and clover fertilizing has restored the uplands, until the product of our farms has more than quadrupled in the last fifteen years. This has given us leisure to build barns, import improved breeds of stock, and supply ourselves with superior implements and machinery, and these all combining have given to our farm houses comfort and elegance.

Farm lands are more rapidly advancing in price probably than any other species of property in the county, and while last season was disastrous upon account of the drouth and the devastations of the chinch bug, there has been no abatement in the demands for tillable lands for the coming season.

Wheat and corn are our staple products, the former in usual seasons, with improved tillage averaging twenty-five bushels to the acre, and in many instances exceeding forty. Corn produces, in our true corn lands—levied river side farms—from sixty to one hundred bushels per acre. Barley is also becoming a favorite crop, our lands being peculiarly adapted to the production of a large yield of bright, plump grains, commanding the highest prices in the markets. Clover and timothy hay always insuring remunerative prices, are likewise taking up our meadow lands.

Cattle, sheep and horses thrive well, and cholera does not so disastrously ravage our stock hogs as formerly.

Fruits do exceedingly well in good situations. All things promise well to the farming interests of our section in the future.

GERARD REITER, Secretary.

LAKE COUNTY.

Lake county is the northwest county of Indiana, at the extreme south end of Lake Michigan, the county seat (Crown Point) being forty miles from Chicago, and its northwest corner on the lake not more than fourteen miles from the great city. Such close proximity has had a great influence in shaping the agriculture of Lake county, and will be more especially marked in the future.

With the exception of the lands bordering on the lake, it is chiefly fertile prairie interspersed with thrifty groves, and timber along its water courses.

Geographically, Lake county stands without a rival in the State. From the east it commands the entrance to Chicago, and is on one of the world's great highways of commerce. Already six trunk lines of railway pass over its surface—the Baltimore & Ohio; Lake Shore & Michigan Southern; Pittsburg, Fort Wayne & Chicago; Chicago & Grand Trunk; Michigan Central; Pittsburg, Cincinnati & St. Louis—all trunk lines to the seaboard, bearing on their tracks not only the inter-State commerce of our people, but carrying on its trains the interchanging products from, and for, distant lands across the sea, to mingle in the commerce of the world. Besides these, there is the Indianapolis Air Line now nearly completed, the Atlantic & Chicago, and New York, Chicago & St. Louis, both being rapidly pushed toward completion. The Joliet division of the Michigan Central is an important feeder for that road, and makes its junction in this county.

To many the wilderness of sand and sloughs along the lake was looked on as a barren waste—worthless; but like Venice in the olden time, the wealth of that region lies in what casual and superficial observers considered as her disadvantages. Very few of our citizens can have any idea or can realize the growth in wealth, and of the proposed improvements on the Grand Calumet, in fact, on the whole south shore of Lake Michigan, in this county. The improvements of the harbor at the mouth of the Calumet at South Chicago has given a value to all the waters of the Calumet that can hardly be estimated; promising to be one of the best harbors of the lake, it has made it possible to utilize the Calumet, its lakes and its bayous, for lake commerce, and its possibilities seem to grow and expand with such rapidity that only those who see for themselves can believe the marvelous growth in the Calumet country. There is Hammond, in Lake county, a town of workers, one firm slaughtering from 300 to 500 head of cattle per day; vessels from the lake unload at her docks. Pullman, on Lake Calumet, to-day almost a city, had, a little over a year ago, not a house on the ground. Irondale and South Chicago, just across the line and in our own County of Lake; the purchase of Wolf Lake and its 8,000 acres by a company of wealthy capitalists, is an assurance that East Chicago will be one of the best harbors, business and manufacturing towns in the suburbs of Chicago. At East Chicago there can and will be a harbor that for capacity will surpass Chicago. All these changes in our surroundings will have a decided influence on our mode of farming. Market gardens will be cultivated with profit. Less wheat will be raised. Nearly all the dairy farmers now buy their flour. Private dairies are increasing, and the cheese factories are working with profit and satisfaction to all concerned. We have no butter factories at present.

The 23d annual fair of our Agricultural Society was held at the fair grounds at Crown Point on the 5th, 6th, 7th and 8th, of October and, considering the rainy weather, was a success, paying all premiums in full. This we have always done.

The show of horses with us is always good, and is improving.

There has been but little interest hitherto taken in sheep, but in this there is a change. The talk is all for mutton sheep, not fine wool. The Cotswold and its grade seems now the favorite.

Each year there seems to be improvement in hogs. Poland Chinas in the majority; some hold on to the Berkshires as the best bacon hogs; some have the Duroc; all these were represented. We had also a fine show of Victorias, a white breed, originating in this county. They are steadily and surely working their way into popular favor. They have taken prizes this year, and last, at the fat stock show in Chicago.

The display of cattle was not so large as in former years, but the specimens shown were up to the average. The short horns take the lead; but the Jerseys for the dairy, and the Herefords for beef. are receiving much attention from those interested.

Poultry were in excess of former years. The improvement was very marked.

Mechanical department well represented.

Domestic manufactures and fancy articles not as good as usual.

Fruit a failure this year, but few entries.

Our fair grounds of forty acres belong to the county; in the center is a lake of twelve acres; the driving track sweeping entirely around it; each day we had trotting or running races.

And now a word or two on the fence question in answer to your circular. The almost unanimous opinion here after trying all plans, is that every person must and shall take care of his own stock—fence in. This is practically and successfully enforced all over the county except in one or two towns.

Barb wire is coming more and more into use.

Fairs should be in their best sense educational, to learn as well as to amuse.

Lake county people look on the fair as a social gathering, a re-union of old friends and neighbors, and a fair to succeed must keep this steadily in view, and admit nothing that shocks the moral sentiment of the community, or the best people will stay at home.

The interests in the horse can not be sustained without trials of speed, but when a fair runs all to racing and betting it is bound to go down.

Above all, a fair must be in the interests of honest labor, an exposition of the best work of the county; keep to this and you are building on a rock.

A fair at this day must be more than a mere show, it must have a business side to it; it must have such specimens of stock, etc., that will convince by contrast their superiority, so that the man that looks, may learn, and consulting his own interests, buys and takes home to improve his own flocks and herds, thus becoming more interested in his vocation, and increasing his income by better returns. This is the business side of the fair, and it pays. Many of our farmers avail themselves of these opportunities at every fair.

More attention should be given to statistics by the assessors. Some of them think it is a foolish idea of some old visionary. Such men are not fit for their position. The only way is for the State to persist in what they have so well begun, and people will become educated up to it.

From the report of the State Board of Equalization and comparing the counties, showing the number of miles of railroad in each county, Lake county stands third, only two counties, Marion and Laporte, having more.

We find from the second report of the Bureau of Statistics, that in wheat, Lake county ranks low, having only raised in 1880, 54,434 bushels. Corn, 939,239 bushels reported for Lake county in 1880. Forty-three counties fall below this.

Oats—Lake county raised more than any county in the State.

Hay—Lake county stands seventh, only six counties report more.

Butter—Only one county makes more butter than Lake county—the county of Allen.

Horses—Forty-six counties report a smaller number than in Lake county.

Hogs—Forty-one counties fattened a less number.

Sheep rank low—only about six thousand head.

Cattle rank high—eighty-six counties fall below the number owned in Lake county.

The outlook is encouraging; better tillage; much attention given to drainage; good houses, barns and stables are being built all through the county.

GEO. I. MAILLET, Secretary.

LAWRENCE COUNTY.

The thirteenth annual fair of the Lawrence County Agricultural Society was held at the fair grounds in September, 1881. The unusual drouth prevailing in this part of the State prevented the usual display of agricultural products. The wheat crop of the county was not above the average, and the corn crop was cut short by the dry weather, together with vegetables of every kind.

The greatest source of wealth to the county is found in the oolitic limestone so abundant in the vicinity of Bedford. The quarries are being largely developed, and several thousand car loads of stone have been shipped from the Dark Hollow quarries alone during the last season. The beautiful stone now being used in the construction of the State House is largely taken from them, and our stone is shipped in large quantities to New York, Chicago, St. Louis, Louisville and other cities.

The valuable timber is rapidly disappearing, but the rich bottoms of White river and Leatherwood, and the abundant blue grass lands of the county, together with the immense ledges of building stone, can not fail to make the county one of the most wealth producing in this part of the State.

The miserable condition of the public highways has more to do in keeping back the agricultural interests of the county than all other things combined. There is not a single turnpike or gravel road in the county, and during a large portion of the year, and at the time that agricultural products command the best prices, the roads are almost impassable. This is very damaging to the owners of small farms who do not depend on raising stock, and if some means could be devised to compel the construction of highways, such as would be passable in the winter and rainy seasons, it would redound greatly to the interest of this part of the State.

WILLIAM ERWIN, Secretary.

LAGRANGE COUNTY.

The Lagrange County Agricultural Society held its twenty-ninth annual fair at the grounds of the society, in Lagrange, on the 21st, 22d and 23d days of September, 1881.

The attendance was perhaps not as large as last year, owing no doubt to the partial failure of the wheat crop, and to the fact that several fairs in adjoining counties were held about the same time. Great interest was manifested by those who were in attendance, and taking into consideration all the facts and circumstances connected with the meeting it may well be called a success.

The number of members is	514
The number of entries was	719

All branches of industry of the county were well represented.

The display of live stock and farm products was one that the farmers of Lagrange county have good reason to feel proud of.

The floral display and articles of domestic manufacture on exhibition were indeed a credit to the ladies of the county. It bespoke not only their industry but also that exquisite taste which only the ladies know so well how to display.

The society paid in premiums this year the sum of $452.30.

At present the society is troubled somewhat with an old debt, but there is fair prospects that the trouble will be of short duration. There is now a movement in the direction of having the debt all paid up by the next annual meeting of the Association, and there seems to be no reason why the progress of the society in the future shall not be onward and upward until it shall have gained the topmost round of success.

Since the last report this county can boast of a new industry. It is a cheese factory. It is situate at Lagrange and it now bids fair to be a success.

In regard to our county in general we feel that we have but little reason to complain. In point of agricultural resources, freedom from debt, educational privileges and general prosperity, Lagrange county will compare favorably with any county of its size in the State.

The total receipts of the society this year were	$826 00
Total expenditure	815 75
Leaving balance on hand	$10 25

F. D. MERRITT, Secretary.

LAPORTE COUNTY.

The thirteenth annual fair of the Laporte County Agricultural Society was held at the county fair grounds on the 21st, 22d and 23d days of September, 1881. The attendance and the number of entries was better and larger than usual.

In the matter of fine stock our county has taken a largely increased interest, and the magnificent exhibit would reflect credit to any State fair. Two herds of Jerseys and a number thoroughbred Durhams and Devons formed an attractive feature.

Crumpacker, Winters & Co., of Westville, have recently imported a number of horses and mares from the best horse provinces of France.

The Door Prairie Live Stock Association, of this county, are importers and breeders of Clydesdale and Hambletonian horses and mares.

Marion J. Ridgeway's stock farm, near the city of Laporte, is one of unusual interest to admirers of fine stock.

Several of our farmers are importers and breeders of Clydesdale horses, fine cattle and sheep.

Our exhibit of machinery was very good. The display of buggies and carriages also attested the enterprise and skill of our manufacturers and mechanics.

The exhibition in floral hall was excellent, and the display of textile fabrics and fine arts reflected much credit to our ladies.

The show of farm products and fruits was very good considering the failure in part of all kinds of fruit and grain, owing to the severe winter and drouth, grub worms and army worms whose ravages were felt in all parts of the county.

We have a grand good county, best railroad and harbor facilities of any county in the State, and our excellent markets are exceedingly advantageous to the growers of small fruits and vegetables, and those engaged in the dairy enterprise.

Our farms are in a high state of cultivation, have good roads, while the fine buildings and palatial residences attest the prosperous condition of our farmers.

Our fair was a success. We were able to pay our premiums in full, and general satisfaction was expressed by our patrons and exhibitors with the management.

GEO. C. DORLAND, Secretary.

MARION COUNTY.

The Marion County Agricultural and Horticultural Society holds monthly meetings during the year. The meetings occurring in the months of January, February, March, April, May and June, are held in the rooms of the Indiana State Board of Agriculture; and for the months of July, August, September and October, they are held in different parts of the county; again holding in the rooms of the State Board of Agriculture in the months of November and December. At the February meeting the society held a culinary exhibit, which was managed by the ladies, and was in every way a very gratifying success

In the month of June an exhibit of small fruits, flowers and vegetables was held in the rooms of the State Board. The exhibit of strawberries was very fine; for quality of fruit is seldom if ever excelled, whilst the floral and vegetable department was all that could be expected for the season. The awards were small but served to give interest to the exhibit.

In the months of July and August respectable exhibits were had at each meeting.

In the month of September a fair was held in connection with the Lawrence Township Fair Association, at Lawrence, in this county The management of which was largely shared by the latter association, and was a very successful exhibition.

The society at its monthly meeting in October, held at Elijah J. Howland's home, made its usual monthly exhibit, paying small premiums.

The work of the Society for the year has been very gratifying, and is an advance in point of interest over that of last year. It has required quite an effort to disabuse the minds of many that the Society did not intend in some way to tax its membership, but as fast as the objects of the Society became known, its work has commanded a favorable consideration.

For the future it is intended to hold monthly meetings, and have a culinary exhibit in February, and then, beginning with the June meeting, have monthly exhibits of fruits, vegetables flowers, etc., paying small premiums, which, in connection with the papers and discussions had, will give additional interest to each meeting. Further, it is intended, during the summer and autumn, to hold the monthly sessions in different portions of the county, and offer to all, as near as possible, the convenience and benefits of the meetings.

We are of the opinion that the general interest of agriculture and horticulture can be more effectually advanced by the work as before outlined than in the holding of only one Fair. We at least avoid in this way the "fast ring" influence, besides many other questionable exhibits.

We have demonstrated so fully in the past two years the utility of our plan that we are greatly encouraged to proceed, believing that other counties will find it to their interest to expend their efforts in a like direction.

J. J. W. BILLINGSLEY, Secretary.

MONTGOMERY COUNTY.

The Montgomery County Agricultural Society held its second annual fair on its grounds September 5 to 10 inclusive. The weather was all that could have been desired and the attendance quite large. The stock was certainly as fine as was ever collected on any ground in the State, both in point of quality and numbers, as the list of entries will denote. Among the herds of short horn cattle were to be seen those of H. Sodowsky, Thomas Wilhoit and Elijah Clore, which herds alone make a grand show.

The exhibition in the Horse Department was very fine, the classes all being well filled, making four hundred and forty-six entries in the department.

The Sheep and Swine departments were well filled with the finest the country affords, as was also the Poultry and all other departments. Taking it all in all the fair was most certainly a success, not only in point of exhibit but financially as well.

The management has been highly commended; especially the general good order maintained, which may certainly be attributed to the fact that nothing in the shape of a game of chance or intoxicating liquor was allowed on the ground, and as a result the Association has gained the entire confidence of the people.

Our ground, which is owned in fee simple by the association, contains sixty-three acres, all lying within the corporate limits of the city of Crawfordsville, but half mile from the Court House and with the Louisville, New Albany & Chicago Railroad depot on the west and adjoining the Terre Haute & Logansport Railroad on the east, the Indiana, Bloomington & Western Railroad being but half a mile away. Thus all are afforded an easy access.

A report from a neighboring county says they "*think* they have the finest fair ground in the State." We are decidedly more positive for we say we *know* our grounds are the finest in the State, all shaded by the original forest trees and watered from ice cold springs, the waters of which are forced to all parts of the ground through pipes by steam power, thereby affording water for man and beast not only in abundance but of the best quality.

As before stated our society own the grounds in fee simple, worth at a reasonable valuation twenty thousand dollars, upon which the society has placed improvements at a cost of eighteen thousand dollars, thereby rendering the ground as improved, worth to the society at least thirty-five thousand dollars, which has been bought and improved with a capital stock of fourteen thousand five hundred dollars, with the profits of two fairs, with an indebtedness of but seven thousand dollars.

Our track was built at a cost to the society of three thousand dollars, and is pronounced by all horsemen to be the finest half mile track in the State, and is so situated as to afford a full view of the entire track from surrounding elevations. Our county ranks about third in the State, and with the spirit of enterprise manifested within the last year the time is not distant when she will stand at the head. In the last two years we have expended one hundred thousand dollars in constructing free gravel roads, and the county now has one hundred and fifty-eight miles of well graded and graveled highways and the good work is extending into every part of the county. Almost all our wet land, of which at one time we had considerable, has been or is being drained with both open and under drainage, thereby making the land all tillable and very productive.

The soil of Montgomery County is among the most productive in the world, the well drained black land often yielding as high as one hundred bushels of corn to the acre and as much as thirty-five and forty bushels of wheat. The soil also produces immense crops of clover, timothy and blue grass. It is believed by many well posted on the subject that the blue grass pastures of Montgomery County could be made to equal, if not to excel, the blue grass regions of central Kentucky.

The county is making the most rapid progress in all its industries, and the time is not far distant when she will be pointed out as one of the most highly improved counties in the State.

The new departure in binding wheat has had a tendency to increase the acreage and the prospect for an abundant crop is very flattering.

F. L. SNYDER, Secretary.

MONROE COUNTY.

We have not held any fair for three years, but still hold our lease for the ground, which was secured from the county for fair privileges; the society making all necessary fixtures for holding fairs. There has been much improvement in agriculture in this county in the last few years, also in cattle and sheep, much of the lands being especially adapted to sheep husbandry, therefore, there has been quite an increase in number as well as quality. Cotswold and merino being the leading breeds, and those wishing to engage in this pursuit could find no better county in the State for the business. There is and has been quite a number of horses and mules raised and shipped each year from this county to Cincinnati and Louisville markets, but cattle takes the lead of all other stock, there being large numbers raised and sold. There is no surplus grain raised, all being needed for home consumption.

In portions of the county we have some very fine farming lands, but a great portion is broken hill lands producing the best of blue grass, being originally covered with the best of timber, which is now being cut off very rapidly. There are now two large spoke factories, one plow factory, and two furniture factories in Bloomington, the county seat, that uses a large amount of timber each year.

There are also large deposits of the very best of limestone for building purposes, of which there has been some very fine quarries opened and now in working order, in the vicinity of Bloomington and Elletsville, on the line of the Louisville, New Albany & Chicago Railroad. There is also a manufactory being started in Bloomington for grinding limestone for fertilizing purposes, of which is said to be both cheap and beneficial to the land.

SAMUEL DINSMORE, President.

NEWTON COUNTY.

The Newton County Agricultural Association held its fourth annual Fair at Morocco, on September 6th, 7th, 8th and 9th. The weather was excellent and the attendance good.

LIVE STOCK.

The horse show was excellent. The Norman horse "Dick of Percheron," and "Robbin 10," a Clydesdale, both owned by C. D. Wilson, and M. B. Carpenter's

Norman horse "Rollin" were on the grounds, each showing fine colts, which made an exhibition worthy of any fair in the State. Our county is making great progress in the stock of her horses.

The show of mules was very small, though the quality shown was good. There is a lack of interest in mule raising in this county which is scarcely to be accounted for, as they always bring a good price, and we have an abundance of good grass lands to rear them on.

The show of cattle was confined to grades and crosses. The show was fair and presented a marked improvement over the showing of our former exhibitions.

The entries in hogs, sheep and poultry were very creditable. We are very free from hog diseases in this county, and hog raising is followed generally and successfully. A cross with the Jersey Red and Poland China is becoming quite popular. One lot of spring pigs of this cross was shipped to Chicago in November, and attracted much attention at the Union Stock Yards on account of their size and quality.

Corn raising predominates over every other enterprise in this county. The yield this year is fair, and the farmers are marketing it at from fifty to fifty-seven cents per bushel. Wheat raising is increasing rapidly. It has been thoroughly demonstrated that we can raise winter wheat here successfully, using the drill. Keep the surface water off the field, and run the drill rows north and south, and we have as sure and a more profitable crop than corn.

Agriculture in our county, generally speaking, is in a prosperous and progressive condition. This county is comparatively new yet, and has in it many acres of good farming lands yet undeveloped. What we most need is more men of capital and energy to properly develop the agricultural resources of the county, and more railroad facilities to move our products.

Our fair was a success. We have added several hundred dollars worth of improvements to our grounds, over and above the amount subscribed by members of the association. We owe but a trifle. We are stimulating the stock growing and agricultural interests of the county, affording the people a better opportunity to meet and become acquainted, and always pay our premiums 100 cents on the dollar.

WILLIAM DARROCH, Secretary.

NOBLE COUNTY.

The twenty-sixth annual fair of the Noble County Agricultural Society, was held on the society's grounds, three-fourths of a mile west of Ligonier, October 12, 13, 14 and 15, 1881. The very unfavorable weather seriously affected the exhibition, as well as prevented many from attending. It rained almost constantly during the entire four days of the fair. Sufficient money was realized to pay all premiums and other expenses of the fair. The only deduction was ten per cent. on premiums over $5 in a few special classes, all others were paid in full.

The horse department deserves special mention, both as to number and quality of animals. There were 107 horses shown, and a number of entries made but the animals failed to reach the grounds on account of bad weather. The horses shown were principally Clydesdale, Norman and Hambletonian stock.

The cattle department was rather limited, although the splendid herd of Short Horns owned by Mr. Joseph Ripley was on the grounds, and a goodly number of excellent grade cattle.

Sheep received more attention this year than usual. More entries having been made in this department than for several years. Premiums only for coarse and fine wool being offered.

The show of hogs good.

Poultry and farm products were less than usual. Some products being nearly a failure, others of inferior quality, left this department below the average. Quite a number of specimens of wheat were shown, many of which were of excellent quality.

The ladies' department was very fine. It was pronounced by good judges the best exhibition ever made in this department. The number of articles were not so great as at some of the former fairs, but the quality, fineness and variety of work surpassed any previous display in this department. Much credit is due the ladies of Ligonier and vicinity for their great interest in the fair.

The society own the grounds, are entirely out of debt, and if the right spirit is exhibited by the stockholders, a new floral hall will be built the coming year, and many other permanent improvements made that will tend to create more interest in the fair, and furnish exhibitors better opportunities for displaying whatever they have to place on exhibition.

The crops fell considerably short of previous years. Wheat about one-third crop. Corn crop about three-fourths, owing to the continued dry weather. Other products considerably below the average. The principal product of this part of the State is wheat. Farmers, as a rule, are prosperous, and many of them have supplied themselves with improved machinery to raise and take care of their crops. Much attention has of late been paid to the improvement of stock. Clydesdale, Norman, Magna Charta and Hambletonian horses being bred extensively, and quite a number of herds of short horn cattle are owned in this part of the country.

John H. Hoffman, Secretary.

PARKE COUNTY.

The second annual fair and exhibition of the Parke County Agricultural Society was held on their handsome grounds, one-fourth mile west of Rockville, Ind., on the 9th, 10th, 11th, 12th and 13th days of August, 1881. Considering the great drouth, which had fairly begun at this time, it was thought by some that the fair would be a failure, but, on the contrary, the attendance of visitors and stock was more than double the expectation of the society. The receipts at the gates and other sources more than paid the liberal premiums offered by the society; and all premiums awarded, as well as all other claims, were paid dollar for dollar, and leaving a nice little surplus for the coming exhibition.

Encouraged by the result of our first fair in 1880, our Board of Directors erected one of the finest fine art halls in the State, being in the shape of a cross sixty-four feet long each way; the center of the building being used as a floral display which was occupied mostly by plants from the fine green house of Perley Tenbrook, of this city, which attracted large crowds daily. The building cost about one thousand dollars.

The Directors seeing need of more buildings, erected a large and commodious mechanical hall, a large amphitheater, seating about fifteen hundred persons, also one hundred additional stalls, making the number of stalls three hundred.

The number of entries in the several classes of horses, cattle, sheep and hogs, was equal to that of some of our State fairs, and some of the animals have since taken premiums at the Indiana and Illinois State Fairs.

The exhibition of textile fabrics, ladies' fancy articles, fine arts, fruits, and provisions in the various halls was splendid.

A full line of buggies and carriages was on exhibition and attracted much attention.

The large display of machinery exhibited by our hardware merchants attracted large crowds of "honest farmers."

Agriculture in this section is in excellent condition, and farmers as a rule are prosperous. They are supplying themselves with the best of machinery to raise and to take care of their wheat and corn crops, which are the two main crops in this county.

Much attention has been paid by our farmers to the raising of fine horses, cattle, sheep and hogs, since the exhibit of the fine herds of short horn cattle, owned by Gains & Son, of Ridge Farm, Ill., and E. Evans, of Russelville, Ind., at our last fair. It has created a boom in the fine cattle breeding, and we can now show some fine specimens in that class.

As to the speed ring, it was filled in every class, and as our premiums were liberal it drew some of the best goers in the State. The horsemen say we have one of the finest tracks in the State, which will always draw the best of horses.

One of the many attractions was the fine music furnished by Prof. White's Cornet Band, of Rockville. They play with the best bands in the State, although the band is only six years old.

The receipts of the fair were		$2,878 00
Premiums paid	$1,910 00	
Other expenses	630 00	
		2,540 00
Balance in treasury		$330 00

The friends of the society are now encouraged, and with good weather for next year's fair our indebtedness will be all paid.

DAVID H. WEBB, Secretary.

PERRY COUNTY.

The fair held by the Association this year was a financial success. The exhibit in the halls, though smaller than in former years, excelled all previous exhibits in quality. Our stock exhibit was small from the occurrence of the Hartford and Owenboro fair during the same week. Receipts amounting to $996.84, and expenditures, $753.85. Balance in treasury, $43. From its first existence the society has never failed to pay a single premium awarded, and bids fair to be a success in the future. The wheat crop of the past harvest was very light, from the work of the fly. Corn light, scarcely sufficient for home consumption. The potato crop about half a yield on account of drouth. Fruit crop a failure. The acreage for wheat is small from scarcity of seed. The acreage for barley is larger than for some years, and both crops at present are looking favorable. The condition of agriculture is improving in way of the use of fertilizers, clover and rotation of crops. Many of the improved implements and machinery are being introduced.

FLINT DEWEESE, Secretary.

PORTER COUNTY.

The Porter County Agricultural Society held its eleventh annual fair on the fair grounds adjoining the city of Valparaiso, on September 27th, 28th and 29th, 1881.

The show of stock in all the departments was a perfect success. The show of grain and farm products was creditable.

A liberal premium was offered in the speed ring which was spiritedly contested for by the exhibitors.

The farm implement show was a perfect failure. Dealers in these articles taking no interest in the fair whatever. The county built a cottage house on the grounds the past year at a cost of $600, that we may have a suitable person at hand to care for the buildings and grounds. The condition of agriculture the present year is favorable. Some of our crops are short, but the advance in price makes them equal to previous years. Wheat half a crop. Corn three-fourths of a crop and not first quality. Oats, same as corn. Hay, a moderate yield and good quality. Potatoes, not an average crop. Our corn is all fed to hogs and cattle and we furnish the Chicago market with large quantities of these products each year. We have the best of railroad facilities, there being seven lines completed and another nearly ready for the iron, all terminating in the city of Chicago. The Northern Indiana Normal School, and business Institute located at Valparaiso, our county seat, numbering fifteen hundred students makes business lively and adds to our home market.

The Treasurer's report shows

Receipts	$658 66
Expenses	655 76
Balance	$2 90

T. KERNE, Secretary.

POSEY COUNTY.

The twenty-third annual fair of the Posey County Agricultural Society was held on the grounds belonging to the society, just east of New Harmony, August 29th and 30th, September 1st, 2d and 3d, 1881. The first fair of the present society was held on the same grounds in 1859, and have held a fair each year since, always paying every premium and expense orders in full.

The twenty-four acres of ground have been improved with good substantial and commodious buildings, with a large number of horse and cattle stalls, with a number of hog and sheep pens, and plenty of wells to always furnish an abundance of good water.

The receipts of the twenty-third fair amounted to fourteen hundred and sixty-four dollars for admissions, and twenty-nine hundred and sixty-nine dollars for rents and per centages. The expenses were for premiums paid, twenty-two hundred and forty-one dollars, expenses of repairs, building, music, and all incidentals in running the fair, fifteen hundred and forty-one dollars. The amount on hands after all settlements were made amounted to six hundred and thirty-four dollars in cash. Since then the society paid to the P., D. & E. R. R. four hundred and fifty dollars as a bonus for running through the north corner of the fair grounds, which will place us in good communication with the *fair* railroad travelers.

The wheat crop in the county was an average of about half a crop, and the corn not quite half of the usual amount.

Apples were abundant in some localities, and enough for the local demand of the county, with a small surplus. Peaches and other fruits were rather scarce.

All kinds of stock have done well and been healthy during the year, the hogs were mostly sold on foot and driven to other markets out of the county.

There was quite an amount of wheat on hands held by the producers that was bought up on speculation, and has about all been disposed of.

The constitution of the society was so amended that the annual fairs shall be held commencing on the second Tuesday in September.

L. PELHAM, Secretary.

PULASKI COUNTY.

The eighth annual fair of the Pulaski County Agricultural and Mechanical Association was held at Winamac on the 4th, 5th, 6th and 7th of October, 1881. Notwithstanding the heavy rains on the first and last days, it proved a complete success financially; and in the exhibits in the various departments the show of horses, cattle, sheep and swine was largely in excess of those exhibited in 1880 and of a better grade. In the poultry, agricultural, horticultural and other departments the display has never been equaled.

The wheat crop was of fair yield and excellent quality. Corn an average yield, and fair in quality. Oats not more than half a crop, and medium in quality. Hay was an average crop, and excellent in quality. Potatoes in yield almost nothing, in quality fair. Cabbage and turnips good; much better than in 1880. Fruit generally scarce, but fair in quality.

Valuable improvements have been made the past year in the way of farm buildings, and fruit and ornamental tree culture. Also many ditches of large size have been cut, which has made tillable hundreds of acres of the best land in the county. The county is being largely settled by a thrifty class of foreigners, which in a few years will make it blossom as the rose.

JESSE TAYLOR, Secretary.

PUTNAM COUNTY.

The agricultural interests of Putnam county are in a good degree of prosperity and advancement. This, however, is only a natural consequence considering transportation facilities, the steady perseverance of the people, and her rich, vigorous soil. A generous rivalry, long since aroused among the farmers, has caused a great improvement, both in the condition of the farms, and the methods employed for their maintenance. The well conducted farm of to-day, with the owner's comfortable residence, ample, well stored barns, and fortified upon all sides by sturdy acres, presents a very attractive picture of rural life.

Thoughtful attention to the best methods of farming, coupled with painstaking toil, are daily applied, and a bountiful yield at harvest time is the common reward. The grazing business predominates in this county at present, but the cultivation of grain is assuming larger proportions every year. A comparison of the statistical reports of 1879 and 1880 shows a gratifying increase of the principal crops in favor of the latter year. The increase of wheat was 25,682 bushels; of corn 255,162 bushels; of hay 4,432 tons. The productions of the present year were light on account of the severe drouth.

All kinds of improved farming implements and machinery, that do the work required expeditiously and successfully, find ready purchasers among our farmers.

The important subject of drainage is receiving careful attention. Drain tiles are in general use, and in consequence many swamps and wet spots, once profitless, are now thrifty fields.

Our public highways are receiving much better attention now than formerly, and the most of them are in fair traveling order. The toll roads are kept in excellent repair.

For the most part, our farms are protected from the incursions of vagrant stock by good fences. As a strong, well repaired fence is one of the principal indications of a thrifty farmer, every farm should present plain evidence of the fact.

The great improvement in the quality of all kinds of live stock, and the steady increase in number, is noteworthy. The increase of cattle in 1880 was 2,742 head over that of 1879; of fatted hogs, 1,376 head; of sheep, 121 head; of horses and mules, from some unknown cause, there was a slight decrease; of pounds of wool, in the above compared years, the increase was 71,695 pounds. In general, our live stock receives very kind treatment. Suitable barns and sheds in which to protect them from the rough blasts of winter are found in all parts of the county, and a better quality and quantity of food is distributed.

"The present law for the protection of sheep from dogs," said a prominent sheep breeder to the writer recently, "is very efficient, provided it is rigidly enforced." This being the case, only proper vigilance on the part of those most interested is necessary to keep it in active operation.

The benefits that result from statistical reports, and the custom of placing them within the convenience of the public can not be too highly praised. The present system, by which they are collected, insures a speedy, thorough and accurate compilation, and it should receive general aid and encouragement.

In view of the protracted drouth of last summer, the Putnam County Agricultural Society reluctantly withdrew the fair of 1881. Ample preparations had been made for an exhibition surpassing all previously held in the county, but subsequent events proved that the withdrawal was a wise action. The society is very desirous of placing this feature of public good upon a solid, enduring basis, but so far it has met with very indifferent success. The plan by which it may be improved and perpetuated, must be obvious to all. A generous, united effort on the part of the people of the county alone is required.

A. O. LOCKRIDE, Secretary.

RANDOLPH COUNTY.

One day devoted to make entries, and two days rain out of the four days advertised for a county fair are certainly important factors in the financial results of the enterprise, and the man who studies cut a successful system of holding agricultural exhibitions, not subject to the uncertainty of the weather, would certainly be entitled to a silver cup of the standard usually employed for premium purposes.

September 14th to 17th, was the time that the eleventh annual fair of the Randolph County Agricultural, Horticultural and Mechanical Association was in progress. We had two rainy days, and consequently not a very large attendance on the last day, but our fair was a success in everything except the weather and finance.

We had the usual number of entries in most of the departments, while the number of entries in the agricultural department was the largest and the display the finest ever seen in this part of the State.

The horse department was well filled, and the show of fine imported stallions at the numerous county fairs throughout the State is certainly the forerunner of a general improvement of the various breeds of horses in the State, and this county is fully up in this department judging from the numerous fine animals on exhibition at our fair with the balance of the State.

The show of cattle was extra good, several herds of short horns from adjoining counties were on hand, and came in for a full share of the ribbons, while the exhibition of graded stock and Jerseys was unusually fine.

In the hog department the show of Poland China and Berkshire predominated, these breeds were followed closely by Chester Whites and Jersey Reds, and from the fine quality of the hogs on exhibition it seems there would no longer be a chance for much improvement unless it would be in the direction for *speed.*

The sheep pens were full of fine and attractive animals, and the business of wool growing is again assuming its former magnitude, and a thorough enforcement of the last dog law will no doubt add much to the side of profit on the ledger of the wool growers of the State.

The poultry fanciers were not so numerous as in years gone by when the poultry fever was so contagious in this State. While we lack in number of entries the quality is however fully equal to former years, and the profits of the poultry yard are by no means insignificant, as one firm ships hundreds of tons of dressed poultry from this point every year, besides paying correspondingly large amounts for eggs, and thanksgiving day would have long ago been abandoned were it not for the turkey.

The show of fruit was comparatively small owing to the heavy loss of trees throughout this section of the State by hard frost, fully one-half of the apple trees have died, and many more are badly injured. Pears shared better, while grapes, the vines were nearly all killed to the snow line, which have now nearly recovered and promise a fair crop of fruit in another season.

The average of our crops were good, wheat was equal in quality to last year, and over an average crop. Corn was one of the best crops ever raised in the county. Hay, a large crop saved in good condition, while oats and flax were short but well filled. Potatoes planted early gave a full yield, while the crop of late ones was almost an entire failure.

All the products of the farm bring good prices, and farmers as a rule are fast getting out of debt.

D. E. Hoffman, Secretary.

RUSH COUNTY.

By reference to the entries of our fair in tabular form, sufficient facts will be adduced to satisfy all inquiry for practical knowledge. Stockholders and citizens of our county all take a deep interest in our prosperity.

The most casual observer, in the habit of attending our fairs, could not fail to observe that there was a falling off in the number of swine, although the quality was superior; yet it must be admitted that this grand staple in the corn belt of Indiana should have every impetus freely given it, that its merits deserve. Transportation to and from fair grounds, and the requisite watchful care in the heated season, are matters that should be well considered by all agricultural boards, in forming their premium lists.

The extravagant advertisements of world fairs, expositions and state fairs, with their overshadowing influences, cause too many to underestimate the true value of our local or county organizations. Each in its sphere has its salutary influence. Home is the place for our most energetic efforts, the garden, the orchard and herds at home, preparatory to the first dress-parade on the county fair grounds, or that of your near neighbor, if they are first ready, and invite you, then care for the slaughtered, and on to battle. If you would have an effective regiment, let us look well to the drill camps. Having been honored for a number of years with the secretaryship of this society, and now being called on by the secretary of the State Board of Agriculture to answer many important interrogations, I feel my obligations, but more my inadequacy.

The agricultural progress of Rush County is no "sealed book," "not a light under a bushel." Whither I go on all our leading thoroughfares, in rain or storm, my vehicle rattles on well graded and graveled pikes. Tile drains are doing their successful work in nearly every locality, and no doubt felt as to its beneficial effect. Now, between Christmas and New Year, the wheat fields have on the appearance of the last of May or the first of June. I do not suppose there is any portion of the States that comes nearer farming in mixed husbandry than Rush County. Corn, hogs, wheat, hay, cattle, sheep and grasses, the grazing or pasture land the largest share, the greater part of the wood lands now being set with blue grass, while clover is largely used as a fertilizer. Some grazed and much mowed for cattle and sheep, and second crop cut for seed. As a general thing, nearly all the farms are adorned with neat, comfortable houses. In many cases some would call it extravagantly so.

As far as my knowledge extends the efforts are to build more barns and feed sheds for the more comfortable feeding and shedding of all kinds of stock and securing food from waste; also in building spacious and rat-proof corn cribs, saving the corn from weather, and thereby ridding the premises of those pests. Most all farmers aim to raise all kinds of orchard fruits for home use. Many orchards were damaged by last winter's cold, yet the spirit is to replenish with new trees.

As to fencing stock in or out the popular spirit here is, let every man take care of his own stock, in his own way, and on his own premies. And as to the dog law, the old one was popular, and I think would have been more so in the country if it had been more stringent.

We are now in a transition state relative to how we shall keep up our fences in the future. What shall be the material? how constructed? taking into consideration efficiency, cost and durability. The day of the old, revered worm fence is fast passing away in this region. Honor to its memory; a memory that in future days will inspire some plaintive bard with more impressive sentiments than he who sang of "The Old Oaken Bucket." A substitute to take its place is now the question. May I now for the present be excused from this unsettled subject until wiser and more experienced heads blaze out the seeming way. But one thing I will venture to assert is, there will be no plan of fence adopted that will not call for a superior article of posts, and he who first sows locusts and catalpa seed and carefully nurtures them to a thrifty start, will be the lucky man. Tree culture, I fear, has not received that thought from the agriculturalists of Indiana that its merits deserve. Most of us, if offered twenty per cent. on an investment to run ten years, and satisfactorily secured, would embark in tree planting especially. Time is money, and time judiciously utilized is the most capital that is required, but lost when not appropriated. Where permanent fences are required let us suggest that trees be planted ten feet apart in straight lines, on which at the end of ten years barbed wires could be spiked. Now name your sum of expenditures, and would two hundred per cent. added to your investment satisfy you to have those trees destroyed? I read that in ten years the walnut acquires a sufficient size, equally so the catalpa. I name not the locust, from the fact that with some it would on farm land be objectionable from its spreading disposition, anywhere else that quality would be commendable; but if used it must be protected from sheep in early spring as they will strip them of their bark. But before the decision is made among the many candidates that may be presented from the forest family, let those who may be acquainted with the osage orange as a tree in our climate, lay before us its claims. Specimens can be seen in all neglected hedge rows. It grows erect, of thrifty growth, it does not sprout, defies the storm, its surface smooth, will beat them all to hold a staple, and its wood when cut as durable as iron.

Mr. Secretary, there is a big work devolving on your able State Board in the furtherance of those many interests connected with the prosperity of Indiana.

L. Link, Secretary.

SHELBY COUNTY.

The eighth annual fair of the Shelby County Joint Stock Agricultural Association for 1881 was held near Shelbyville, during the first week in September.

Notwithstanding the extreme heat, dust and dry weather the exhibition was fully up to any of our former fairs. Our Board of Directors prohibited the sale of any privileges to persons with wheels or other gambling devices. As these privileges have been sold in former years at exorbitant prices, our surplus was not quite as large.

We paid our premiums in full however and all other expenses, and had about five hundred dollars left.

The competition and show in stock, especially horses, surpassed greatly that of any previous fairs, all departments were well filled. Our total number of entries showing an excess of about four hundred over any former exhibition.

CONDITION OF AGRICULTURE.

Our county as an agricultural district is not surpassed by any in the State. Year by year we are growing into a better condition by properly preparing the soil by the use of clover as a fertilizer and drainage by ditching, tile-drain, rotation of crops and better cultivation; this our farmers are able to do with the improved machinery they are using.

In our district the farming that predominates is grain growing, principally wheat and corn.

In reference to buildings none but the most substantial and convenient are being built.

CROPS.

Wheat, one-third to one-half less yield as compared to crop of previous year, and quality not as good, attributed to being injured by frost about the first of April. The present stand of wheat at this writing is very fine, being heavy and rank, and gives promise of as large a crop as was ever produced in our county, as there is a remarkable increase in acreage.

Corn not to exceed half a crop the quality of that produced is considered very good. All other farm crops, includiug fruit and vegetables may be called a failure all owing to the long continued drouth.

A. J. Gorgas, Secretary.

STEUBEN COUNTY.

The Steuben County Agricultural Association held their sixth annual fair on their grounds, at Angola, on October 11, 12, 13, 14 and 15. The fair was not a success, and the horse, cattle, sheep, hog and mechanical departments were not as full as last year, though we had a fine display in Agricultural and Floral Hall. The weather was simply not endurable, it rained every morning and afternoon; and where the people came from, I do not know, for our attendance on Thursday was equal to last year, and rain came down in torrents (second Deluge).

The condition of agriculture in our county is good. Our farmers as a rule take some agricultural paper. We have three county papers, and they have a farm department. Our wheat was about half a crop. Corn fair, hurt some by late rains while in shock. Hay and oats good. Potatoes fair. Apples good.

B. F. Dawson, Secretary.

ST. JOSEPH COUNTY.

The Northern Indiana Agricultural Society was organized as a joint stock company January 20th, 1881. Owing to delay in selecting a suitable tract of land, the location was not made until too late to hold a fair this year.

The grounds, which were purchased by the board of county commissioners and leased to the society, consist of forty acres of beautifully shaded land on the east side of the St. Joseph river, one and one half miles from South Bend, and midway between that city and Mishawaka, the two principal towns in the county. We intend to get our grounds in shape so as to hold a fair in the autumn of 1882. Much interest is manifested by all manufacturers and farmers in our success. Our county is largely a manufacturing one. Our farming as well as our manufacturing interests are in a prosperous condition, and we hope to make the first fair of the Northern Indiana Agricultural Society a success.

C. G. TOWLE, Secretary.

SWITZERLAND AND OHIO COUNTIES.

This society held its thirtieth annual exhibition September 13 to 17, 1881. As far as the number of entries and qualities of articles was concerned, it was a success; but the attendance and receipts were not what we had desired. This we think was no fault of the management, but resulted from causes beyond man's control. The season had been unpropitious; the long continued drouth had ruined the hopes of the farmer; vegetation was dried up, and it was difficult to get enough water for stock; the President had been assassinated; Michigan was burning up; the people seemed disheartened, and it looked as though Mother Shipton was to be verified; yet we were confident that this old world would continue its unceasing roll, and that the rain would come after a time. We added other attractions to our fair, balloon ascensions, etc. We were hopeful, we had held fairs before in time of drouth, and with success. We had never dried up, though we had been drowned out; and that was to be our fate this year. Fair week came and the rain came. It came early and continued late, the three or four inches of dust gave place to five or six inches of mud, and fair going was made a rather serious task. This cut off much of our attendance from a distance, and lessened our receipts, perhaps a thousand dollars, but it was all right and we could not complain, just what everybody and almost everything needed. Fortunately we had a reserve fund in our treasury. We paid about the usual amount of premiums, more than usual expenses, every cent of our indebtedness, and yet we have a little reserve fund. Our officers have been elected, list revised and some of our plans laid for the thirty-first annual fair to be held Septembar 11, 12, 13, 14 and 15, 1882.

CONDITION OF AGRICULTURE.

As indicated in our fair report, our crops for 1881 were short. The previous fall was unfavorable for seeding, followed by the severe winter, the wheat crop was well nigh a failure. Many fields that were sown on the uplands, were never harvested, and the crop for the whole district was not more than one-third or perhaps one-fourth average. Hay about one-half crop. Potatoes and corn not more than one-third, and other field crops about ditto, excepting the oat crop which was about an average; and the tobacco crop, which, owing to the late and favorable fall, turned out better than was anticipated, though the worms were very bad requiring the increasing vigilance and labor of the producer for several weeks. This crop promises to become one of our principal products in the future. Already numbers of our hay barns are being converted into tobacco warehouses. In the early season our fruit crop gave fine promises, but did not meet the expectations of our fruit growers, particularly the apple crop, much of which fell prematurely, or was unsound or inferior. The peach crop was quite good, and in some localities in our district this is an important crop.

Remembering the severity of the previous winter, and fearing the worst, some of our farmers, after estimating their winter's hoard of feed and forage, determined to rid themselves of any surplus stock. Accordingly, cattle and hogs were rushed on the market, in some cases at a sacrifice. But Providence has overruled our fears, and fall pastures have been the best of any of which we have recollection. And up to this time, December 27, stock of all kinds could get their living unassisted by man.

Acting upon the admonition that "If at first you don't succeed, try, try again," our farmers this year have sown an unusual breadth of wheat, which now looks very fine. Of the varieties grown the swamp amber, Fultz, silver chaff and Tappahannock are most common; on the flat clay uplands the swamp variety is preferred; on the hills and on the bottom lands there is a diversity of opinion. Of corn we have so many kinds, and these so mixed that we know not the preferences. Under favorable conditions on our creek and river bottoms, 100 bushels per acre is considered a very good yield; on the upland clay forty to sixty bushels are obtained. Of potatoes our leading varieties are russet, peerless, peachblow, early rose, etc., etc. Of brands of tobacco the navy, wax, common white and Golay—the last a popular variety, said to have originated in our county. Of grasses, timothy is chiefly grown for hay; blue grass and orchard grass for pasturage, and clover for a fertilizer. Of clovers, the sapling clover is quite popular. This variety, as the name indicates, is of remarkably large and rank growth, and is also claimed to have originated in this district.

As to preferred breeds of stock we say of horses, there is no opinion common with our people. As in the days of Paul, Apollos and Cephas, some are for one, some another; few agree. We incline to the opinion that the much abused mule, the ever ready mule, the everlasting mule, is really with our people the most desirable animal for general farm use. He is all the time becoming more numerous and is always ready cash for all he is worth.

Of cattle we have but little pure breed, though we have the *graded* short horn and Jersey. With the latter it is milk or nothing; with the former we can fall back on the beef, and this is the favorite stock.

Of sheep we hear the Cotswold most favorably spoken of. We have some of the old Merino stock, but it does not please our people—a little too fine.

Of hogs the Berkshire and Magee or Poland China are the favorite breeds. We also have Chester White, Jersey Red and others.

Of chickens, the Plymouth Rock, Cochin, Leghorn, Brahma and Black Spanish are perhaps the favorite breeds, though of other breeds the name is legion. And the poultry business, including turkeys, geese, ducks, etc., is simply immense.

Of dogs we have the pointer, setter and layer; the howler, the growler and prowler; the Scotch and rat terrier and sheep tearer, etc. This is a tender subject and we will not venture an opinion.

An unusual amount of fruit trees have been set out this season. Of apples, Rawle's Janet, Rome Beauty, Smith's Cider, New York Pippin and Rambo are perhaps the leading varieties, because considered the most prolific and certain bearers, though almost any kind can be found. Of peaches, Crawfords (early and late), the Heath free and cling are among the best. Of pears, the Standard *var.* Bartlett is preferred to the dwarfs. Of plums, the Damson and Green Gage. Of cherries, the Duke and Morellos. Of grapes, the Concord and Ives Seedling. Of Strawberries, Wilson's Prolific and other varieties. Of raspberries the Gregg, which originated in our district, and is the favorite.

In fact we raise some of almost everything that can be grown in our latitude. Of tobacco, the white burley is most common. Of sorghum, the red amber. The most improved machinery for the manufacture of sorghum molasses is now in use with us, and some sugar is manufactured.

This was a densely wooded region, and the timbers valuable, as oak, walnut, poplar, etc. Of timber, there has been terribly wanton destruction. We have thought if the pale face had never seen this part of Indiana, it would to-day have been worth more money than it is with all its modern improvements. No attention has been paid to forest culture, except the black locust for fencing purposes. The indications now are that the barb-wire fence will come into general use, and our farmers almost with one accord are agreed that stock should be fenced in and provided for by the owner, rather than fenced out, or fed by others who always give grudgingly.

Our common dirt roads are in bad condition, gutters, ruts and mud holes; bridges torn up, etc. Our legislature left us for a season without guide or overseer, and everybody's interest being nobody's business, we shall expect this condition to continue until the inauguration of the new order of things.

There has been much talk of a railroad through our counties, which, doubtless, would be a great public benefit. Two surveys have been made, the cost estimated, and some assurances given of its early construction; further we wot not. We have learned to count the chicks after the hatching.

The health of our people is good; the morals of our people fair; our schools prosperous, and the general outlook favorable. We shall look at the bright side and hope for the best.

WM. H. MADISON, Secretary.

TIPPECANOE COUNTY.

The annual fair of the Tippecanoe County Agricultural Association for the year 1881, was held at Lafayette, on the 29th, 30th and 31st days of August, and the 1st, 2d and 3d days of September, and notwithstanding the extreme heat and clouds of dust during the first three days, it proved as usual a complete success. The general exhibit was first class. The exhibit of live stock was very fine, especially in the cattle ring, which was the largest and best show of cattle ever had at any of the fairs held in this county, there being fifteen very fine herds of thoroughbred cattle in the ring.

The poultry exhibit was very large, and the display in all the other departments has never been surpassed. The condition of agriculture is not so favorable as it has been for three years past. The wheat and the fruit crop below the average. The corn is light crop but of good quality. The oats crop was fair. Potatoes not very good, less than half a crop. Hay short.

JNO. S. PETTIT, Secretary.

TIPTON COUNTY.

The fourth annual exhibition of the Tipton County Fair Company was held on their grounds adjacent to the beautiful and flourishing little city of Tipton, commencing September 20, 1881, and continuing four days. During the past two years our fairs have been overrun with gambling and other vices, so much so that the fair of 1881 was in jeopardy. But the managers resolved that no more gambling should be allowed on their grounds, which was carried out to the letter with very satisfactory results, and premiums paid in full.

The exhibit in the horse department was far better than usual, while in the cattle and sheep departments the display was very meagre, owing to the drouth and short pastures. Stock in these classes were in very poor condition, and consequently few entries. The hog show was fine and fully up to the usual standard in varieties and quality. There were Berkshires, Poland Chinas, Yorkshires, Chester Whites and Jersey Reds. The poultry show was very good. Floral hall was well filled mostly with the ladies' handiwork. Agricultural hall was not well filled, vegetables were very scarce, but there was an unusually fine display of cereals, for which our county is well adapted. We had a very good attendance, and on Thursday were favored with a fine address by ex-Lieutenant Governor Will Cumback. All things considered our fair was more than successful.

The crops were very good in this county this year as compared with most other counties in the State. Fruit almost a failure. Potatoes very scarce. Corn good in most parts of the county, average forty bushels per acre. Wheat an average crop, fifteen bushels per acre. Oats good, not much sown, thirty bushels per acre. Hay splendid, two to four tons per acre. Timber badly used up. In some localities the farms are badly neglected. Fences down, bushes up, other places every thing in good trim, fences up, bushes down, buildings in good repair, farms in high state of cultivation, children healthy, wives joyous and happy, and good looking, and last but least, no hog cholera. This county is being improved greatly in many places, where were a few years ago sloughs, swamps, ponds and sluggish swales, are now opened up large ditches in every direction, and these are connected with hundreds of miles of tile drains, which cause these heretofore waste lands to yield an hundred fold, and almost every foot of land in the county is susceptible of cultivation. With these improvements, and with a few more gravel roads in this county, she will be second to none in the State.

W. A. **Maze**, Secretary.

VIGO COUNTY.

In compliance with the requirements of our organization, I herewith submit for your approval the annual report of the society for the year just closed.

The grounds which are used for fair purposes are the property of Vigo county, and comprise a little over fifty-one acres. They were purchased in 1867, the year in which the State Fair was held here, at a cost of $175 per acre, and were leased to this society on the 18th of October of that year, for a period of twenty years, rent free, the society binding itself to hold a fair upon them annually. All the improvements, fencing excepted, belong to the society and may be removed upon the expiration of the lease; but as the grounds were purchased for the present purposes it is not probable that it will ever become necessary to remove anything from them.

The capital stock of the society consists of 400 shares at $25 each, none of which have been disposed of below par value. During the year just closed thirty shares were sold and the proceeds devoted to improvements.

The society is in debt to the extent of $1,500, which is the same amount reported last year. In making preparations for the fair last year, the Board of Directors thought it would be very much to the advantage of the society to pay the premiums in full, and so ordered. The experience of paying the expenses of the fair and dividing the remainder among the exhibitors *pro rata* has resulted disastrously. People coming from a distance with stock or merchandise to be placed upon exhibition, at least like to have compensation sufficient to meet their expenses. They do not like to attend fairs which do not bind themselves to pay anything at all, hence the change. While it is true that the fair of 1881 was not a financial success there are several good reasons for it, and, all things considered, the result has been very gratifying. The drouth of last summer has been almost unparalleled in the history of the country. The cereal crop was short, and fruits and vegetables were almost an unknown quantity. Feed was scarce, and in many instances water had to be hauled miles for the use of man and beast. Under such circumstances it is a wonder that the exhibition assumed the proportions which it did. This accounts for the falling off in the number of entries in the live stock, grain, vegetable and fruit departments. However, the exhibit was a creditable one, and the quality of the exhibition was, in most respects, superior to that of previous years. The elements also contributed their share to mar the success of the fair. The day usually most successful was one of rain throughout, and not a dollar was taken in. Had the day been fine there is every reason to believe the fair would have been a success financially, and the Directors would have had a balance on hand to carry over to next year's account; but as the matter now stands they have no cause to regret their determination to pay the premiums in full, as they are satisfied it is the only manner in which the fair can be made a success.

It is also the policy of the Directors to improve the grounds in a substantial manner whenever the means at their command will allow it. Last year several steps were taken in this direction. The old amphitheater was in a condition which rendered it dangerous. The society could not afford to replace it, but granted the right to the Vigo Amphitheater Company, who have erected a useful structure at a cost of $2,500, which is to be turned over to the society as soon as the company has reimbursed itself, through receipts, for the outlay. A fine art hall was erected by the society at a cost of $387, and is so constructed that it can be enlarged when the necessity requires it. The remainder of the money expended last year was for repairs. Next year it is proposed to erect a power hall, and if the society could bear the expense it would be a good idea to place in it machinery sufficient to furnish all the power which would be required by exhibitors.

Last year the grounds were not rented. The society placed a man upon them to look after them, who received as compensation his house rent. Through picnics and celebrations the grounds brought the society $109.50.

The plan of charging ten per cent. entrance fee on both premiums, for each entry was continued last year, and worked well. The complaint of last year that the exhibitors in very many cases would not stand it, was not experienced at our last fair, and no one refused to make entries on that ground.

The policy of allowing other societies to take charge of several departments has been continued and has been successful. The Poultry and Pet Stock Association had charge of that department, and was permitted to make out its premium list. The Horticultural Society had charge of the fruits, flowers, bread, cakes, etc.

The special premium list last year was another successful feature of the fair, and one which should be encouraged. In this manner our business men contributed $160 in merchandise and $287 in cash, a total of $447, in premiums, for which there were 249 entries.

For several years the gate fees have been steadily decreasing. At the late fair they were $1,622.80; in 1880, $2,049.54, and in 1879, $3,395.92. The decrease this year was caused by the bad weather, the unpromising condition of the crops and the gloomy feeling throughout the country over the assassination of the President.

DAVID M. WALLACE, Secretary.

WABASH COUNTY.

The Wabash County Agricultural Society held their twenty-ninth annual exhibition on the fair grounds, in the city of Wabash, September 13, 14, 15, 16 and 17, 1881, and was a success in every way.

The rain of Wednesday and Thursday was looked upon as almost making a failure of our fair, and did necessitate the holding of our fair one day longer, and in spite of the rain we had the largest show of stock, poultry, vegetables, agricultural implements, and all kinds of mechanical and miscellaneous goods, that goes to make a first-class fair, ever held in the county.

On Friday and Saturday the people turned out in mass, something they never fail to do at the Wabash county fair, which is a county institution, and every one has an interest in its success. Therefore, such a thing as fail is next to impossible.

The fair grounds being located in the city of Wabash, not more than three-fourths of a mile from the court house, and provided with plenty of shade and water, every one feels like spending a day in these beautiful grounds.

CROPS.

Wheat crop was not a full yield, but was good and brought good prices.

Corn was not as good yield nor as well matured as some seasons past, but brought good price in market.

Oats crop was good, better than for some years past.

Hay—good yield and excellent quality.

Our farmers are getting their farms ditched out good. Mostly tile ditches.

There are no less than eight tile mills running in this county, and they have ready sale for all tile made.

GEO. W. PAULING, Secretary.

WARREN COUNTY.

The eighth annual fair of the Warren County Agricultural Joint Stock Company was held on the grounds of the Society at West Lebanon, September 12, 13, 14, 15 and 16, 1881.

In consequence of the unfavorable weather the entries were greatly reduced from last year.

The stalls for horses and cattle were well filled; the display of horses was the largest and finest ever exhibited on the grounds.

Mr. Elija Clove, of Montgomery county, Ind., had on exhibition two very fine herds of short horns.

The show of hogs was by far the largest ever shown, the favorites being Poland China, Berkshire and the Jersey Red, preceding as in order named, although each has its advocates. The rivalry has developed some very fine stock.

Sheep hold a very modest position in our county, no large flocks being kept, but many farmers own a dozen, or forty, or fifty. The long wool breeds and crosses with natives are the favorites.

The show of poultry was by far the finest ever shown on the grounds, and hard to beat any place.

Our Agricultural Hall was very slim, owing to the extended drouth through this section the past summer.

Floral Hall was filled with the finest and richest articles every exhibited in it, which shows that our ladies have not abated in their interest in our exhibitions.

Receipts will not cover expenses by about two hundred dollars.

In conclusion it is but due to the officers of the association to say that they have made every reasonable effort to make the association successful.

JAMES C. MILLER, Secretary.

WARRICK COUNTY.

The Warrick County Agricultural Society held its twenty-third annual fair on the 3d to 7th of October, 1881, on the fair ground near Boonville.

The grounds enclosed contains about twenty acres. Buildings and fences are needing some repairs. They are beautifully shaded and conveniently situated, a railroad running just at one side of the grounds, and in close proximity to the county seat of the county.

The exhibition this year was not as good as it otherwise would have been on account of the drouth; yet we had a successful exhibition.

The number of entries in the various departments was 1,110, much above former years.

In farm products there was not as great a display as we have sometimes had. Neither was there as much stock, especially of cattle, as we have had at other times, though there were some excellent cattle shown.

We have never had a better show of horses and mules. Most of the stock shown was of an excellent grade, but not in as great numbers as on former occasions.

Our membership this year numbered 412 members.

The amount of receipts were $3,258.35. Amount of premiums paid were $1,566; other expenditures, $626.90; total expenditures, $2,192.90; and the amount of cash on hand $1,065.45.

On account of the long and extreme dry weather our crops of wheat, oats, corn and many other products did not yield more than about half crops.

The grass crop was about an average one. The yield of potatoes, both sweet and Irish, were in places an average, but not a large acreage planted.

There was a larger acreage of wheat sown than usual, but not as many bushels raised.

The financial interest of our county is improving as well as the agricultural, which is shown in part by more substantial and valuable buildings being erected, both in our county seat and other towns and in the country.

The progress in agriculture is shown by farmers using more fertilizers on their lands and by raising a better class of crops, and clovering.

There is getting to be a large interest taken in underdraining wet and bottom lands with drain tile, which proves a success. A large benefit from this source has already been realized.

The ground is underlaid with an abundance of excellent coal in most of the county, and is largely mined in many places, but most extensively along the Ohio river and along the railroad running through the county.

There is an abundance of good timber yet in our county.

S. W. TAYLOR, Secretary.

WASHINGTON COUNTY.

The Washington County Agricultural, Horticultural, Mechanical and Industrial Association was legally organized and incorporated in Februnary of this year. Buying thirty acres of land adjoining and part of it lying in the incorporation of the town of Salem, for which it contracted to pay $3,210, and by the energy and industry of some of the friends of agriculture in soliciting and procuring stock to be subscribed, they have paid $1,610 of the purchase money, and have put upon the grounds substantial improvements amounting to over $7,000, and during the fall have had two successful fairs a statement of which will be found in our annual statement for this year. We feel gratified at the success of our efforts to develop interest in agricultural pursuits and products to the extent of having a successful and creditable exhibition. The first year, notwithstanding the adverse circumstances with which we had to contend, it was a common remark of visitors at our first fair " Washington county's exhibit of products is first-class in every particular." Our stock exhibition in most classes was far superior to the expectations of the most sanguine, this was especially true of horses and mules, their exhibition was simply excellent, both in number and quality. Our cattle, hogs and sheep show was more limited in number, but quite creditable in quality and breed. Our poultry show was fine in quality but not as large in number as we wished to see. Exhibitions in all other classes and departments was quite satisfactory. In this connection I submit a copy of an address by the Board of Directors to the public which I think in a fair manner embraces a description of our fair.

ADDRESS.

The Board of Directors of the Washington County Agricultural, Horticultural, Mechanical, and Industrial Association desires, in a fitting public manner, to express their thanks and the assurance of their appreciation of the patronage and endorsement extended the association by the intelligent and enterprising public during our late fair. We congratulate ourselves that our feeble and inexperienced efforts in behalf of the enterprise have been appreciated. We especially thank the enterprising merchants and dealers for the very handsome exposition they made of their goods, thereby greatly aiding the success and adding vastly to the beauty of the fair. By your action and liberality in this regard you have christened our large hall, and it will hereafter be known as Exposition Hall. If we are justified in saying this much for our enterprising merchants, where shall we find language fitting the requirements to express our great obligation to the farming and producing class for their superior exhibition (circumstances considered) in every department, just at the close of a withering drouth that hung like a shadow of darkness over our borders for about three long weary months. It would have been but natural to expect that your class would be discouraged to the extent of making a limited, not to say a shabby, display of your products; but to the surprise of all, yourselves included, you had a display, not only a credit to your county and your locality, but the great State of which you form a part, and perhaps equal if not superior to any county fair in the State. In fact many of our visitors compared it favorably with our State fairs. If you can do so well under adverse circumstances, what may you not accomplish with favorable crop seasons. You have done nobly, and in doing so you have obliged the association. You have pleased and gratified the general public. You are entitled to and will receive the commendation of all for your demonstration that our locality possesses the elements of a successful agriculture second to no locality in the State.

To our stock men we need not speak specially. Your stock on the grounds showed for itself, and was, taken altogether, second to none ever exhibited in Southern Indiana. Your stock was viewed by stock men from abroad, especially from the South and East, and in the near future you will reap the benefit in increased prices for your stock for your present industry and enterprise in breeding and exhibiting such stock.

We thank one and all for their liberal patronage, and it affords pleasure to state that the fair was a success financially. After paying our large expenses and liberal premiums, we have a handsome margin or profit left—enough perhaps to make a ten per cent. dividend on our stock subscription, if we did not apply it for the payment of improvements.

Remember this is a fair for the benefit of the general public, and its success is dependent upon the liberality of that public in patronizing it in the future. Good as this has been we must and will have a better one next year.

At the earnest solicitation of stock men we have concluded to hold two additional days of fair this year on the first and second days of November. Come to our public meeting on the 8th day of October, at the Court House in Salem, where the stock books will be reopened for the purpose of giving farmers another opportunity to take stock. If you want it come and subscribe for it; if not do not complain of others for investing in and taking up what must ultimately become a profitable paying stock. By order of the Board of Directors.

Our second, or rather our two days additional fair, principally for speed rings, circumstances considered, was quite creditable, there being some of the best stock in the State in attendance. Stock men, as well as the general public, endorse the statement that we have one among the best little fair grounds in the State, and a half-mile track second to none in the State. The track is on a level piece of bottom land, skirted on one side by a creek of running water, and on another by a beautiful hillside, affording a splendid natural amphitheater, from which the entire track could be viewed by an audience of two thousand. We have excellent stock stalls and pens, a splendid grand hall in the shape of a cross, 24x120 feet each way, and floored throughout; a good amphitheater, office, etc., and an abundance of as good drinking water as could be desired is supplied by wells on the grounds.

The productions of our county are pretty evenly divided between grazing, grain and fruits, our soils being well adapted to each. Our production of wheat is certainly increased in yield to the acre by the use of fertilizers, which for the last two or three years is becoming general. While there is yet room for great improvement, there has been a marked movement forward in the last five years.

The cultivation of "yaller" dogs is on the decline, and that of good sheep correspondingly on the increase. This is susceptible of proof by the fact it is hard to convict a man of malicious trespass for killing a dog if it be a mean one, and away from home; whereas a few years ago the man would have pleaded guilty to the charge, and have traded the owner of the dog a cow in payment for the damages in killing him.

Our general improvement is marked by the erection of comfortable cottages and residences, barns and out-buildings over the county, supplanting in a great measure the log cabins of a half century ago, and more marked, perhaps, in Salem, our county seat, by the modernizing of old buildings, the erection of new residences and some fine business blocks, that will compare favorably with any of the towns or cities in the State.

FRED. L. PROW, Secretary.

WELLS COUNTY.

The Wells County Agricultural Society held their fifteenth annual fair on the grounds usually occupied by the society, near Bluffton, on September 20th, 21st, 22d and 23d, 1881.

We had been living in hopes of writing up the most prosperous fair ever held in the county, but owing to drouth a long while previous to our fair, and to a heavy rain just the week before the fair, our farmers were engaged in seeding to such an extent that nothing attracted their attention but getting in their wheat, and the fair was lost sight of by a great majority of our farmers, and the consequence was that our receipts were short; and owing to fairs being held in two adjoining counties at the same time it cut our entries and our attendance short, but notwithstanding all the drawbacks, some of our departments were well filled.

Our cattle show was good but not up to last year.

The horse department was up to its usual standard.

Our swine department was good—better than usual. A. W. Ross, of Muncie, Delaware county, Ind., was on hand with as fine a herd of Poland China as the State affords; also, Mr. J. W. Williams, of Jay county, had a fine lot of Poland China on exhibition.

The sheep department was not as good as usual.

We had as fine specimens of corn, potatoes, wheat and other vegetables on hand as usual.

The floral hall as usual was filled to overflowing with the nicest of fabrics made by our energetic ladies. Wet or dry, hot or cold, rain or shine, or let come what will, the ladies of Wells and adjoining counties are always on hand and wide awake about fair time, and see that their part of the fair is made a success.

High waters and heavy ice last spring knocked down and washed away considerable of our fence, and we had more repairing and expenses to foot up than in former years, and attendance being light we had to pay premiums *pro rata*. We only paid sixty cents on the dollar.

CROPS.

Our wheat crop in this county was an average one—about eighteen to twenty bushels per acre.

Corn. About two-thirds of a crop; corn that was planted early and well tilled was good.

Potatoes. A very light crop; damaged by drouth. Not near enough for home consumption.

Hay. About two-thirds crop, and well saved.

Oats. A light crop. But little sown.

Our fall crop of wheat looks well, and promises a fine crop next year.

Our farmers are still carrying on the good work of ditching and underdraining. There was more tile put in the last year in this county than ever before in one year, and our farmers and citizens are still advancing to higher and nobler causes, that of building some gravel roads in our county. We commenced about two months ago to circulate petitions for gravel roads, and we now have four roads granted and ready to sell out as soon as weather will permit to build them.

JAS. R. BENNETT, Secretary.

WHITLEY COUNTY.

It becomes my province under the law, as well as my pleasure, to submit the annual report for the year 1881 of the Whitley County Joint Stock Agricultural Association.

Our annual fair was held on our grounds at Columbia City, Indiana, October 4th, 5th, 6th and 7th. Providence and our fair seem to have met, for while we hoped to give spectators the best fair ever held in our county, Providence did give us the best rain we have had since June 1st, 1881. While the result was somewhat disastrous to our financial success, the good results to fall grazing made ample compensation for our individual losses. Such was the interest manifested however by the agricultural portion of our county, that we can truthfully say that our Agricultural and Fruit Halls showed vast improvements upon former years.

Our display of horses and sheep was very fine. In the cattle and hog departments, however, the inclemency of the weather prevented many entries being made.

The county of Whitley is one of the smaller ones of the State. We have about 200,000 acres of land fit for various agricultural pursuits. We had this year, as near as I can learn, about 40,000 acres in wheat. The average yield was about eight bushels to the acre; or a half crop. We had about 80,000 acres in corn yielding about one-half a crop; or twenty bushels to the acre. We had about 10,000 acres in oats averaging about twenty bushels to the acre. Of the residue of our lands probably two-thirds were utilized for grazing purposes; the other one-third was utilized by the raising of fruits. The drouth of June, July and August injured our corn crop. Taken as a year it was probably two-thirds of an average in all crops. Apples and all small fruits were very fine, large and sound. The culture of peaches in our county is not a success as the winters kill them. Our forests are being rapidly stripped of timber, and very soon the resources of the county will be confined exclusively to those of agriculture.

I find that a number of our better to do farmers are turning their farms into stock farms, the raising of beef for the eastern markets. Sheep raising in some parts of the county has likewise taken a boom, the breed which is being introduced is the Cotswold. Our farmers have tried the raising of a general purpose sheep—i. e., a sheep for wool and mutton, but as a rule have found them unprofitable.

The old fashioned log house of "ye olden time" is gradually giving way all over our county to fine residences, and commodious barns. Fine schools and common sense theme taught large numbers that life is something more than to subsist. Our farmers are beginning to learn what we all have so long known, that theirs are the Herculean shoulders upon which the world rests. Bearing such a burden they are beginning to bear it bravely and with pride. They now know that it does not take a fool, but a smart man to be a farmer.

For rails, our farmers are gradually substituting board fences.

Drainage has become a very important item of expense. Sub-soil drainage is largely carried on, and our courts are now flooded with petitions for large ditches. We have quite an amount of low land which year by year is being reclaimed. When so reclaimed it is as rich as the "garden of the Gods."

The serious drawback to our county is the roads. Our soil, in the greater portion of the county, is a grayish clay of such peculiar geological formation that lime may be burned out of it. We are absolutely without gravel. Still all of our papers are beginning to urge the better repairing of our roads; and it is hoped another year will see some marked improvement in them.

By order of our Board of Commissioners, cattle and sheep are permitted to run at large on the public highways and uninclosed commons of the county. In the view of the writer, the true theory should be to make every man fence in. Fencing out simply means loss of stock, liability of trespasses, the running off of all the flesh put on by feeding, and other ills not now mentioned.

I am of the opinion that, as the dog is a relic of barbaric times, the new statute which requires the barbarian who owns him to register him, is a good and wholesome provision. A baby would keep the farmer awake as well as a dog, and the baby could be kept as cheaply. Down with the dogs and up with the babies.

The value of statistics to the farmer is inestimable. They enable him to plant and raise intelligently.

A word personal to our society and I have done. We are out of debt, have good grounds, fair buildings, money in our treasury, and hope for the future. I trust to report in the coming year, a larger measure of success for him who feedeth all.

THOMAS R. MARSHALL, Secretary.

BRIDGETON UNION.

The society held their twentieth annual fair near the town of Bridgeton, Parke county, commencing August the 22d and closing the 27th. The weather was favorable the entire week; with the exception of the dust which was almost suffocating, and necessitated considerable expense in the way of sprinkling roads and track. Taking all surroundings into consideration, the fair was a success financially. The society built a large carriage hall, sixty first-class stalls, and repaired a large portion of the fence. The show in all the departments was good with the exception of cattle, which owing to the extreme drouth and dusty roads was a failure. The show in the other departments was not as large as in some other years but of excellent quality, the heavy draft horses taking the lead. In the hog department the Berkshire and Poland China were the leading varieties. In the sheep department we had the Merinos, Coltswolds, Leicesters and the Shropshires. There has been quite an improvement in the quality of sheep in the district during the last few years, probably more than with any other class of domestic animals.

The articles on exhibition in the Agricultural Hall were extra good. We will sum up the result of the year in an agricultural point of view as follows: The corn crop was very light in a large portion of the district, the weather was wet in the early part of the spring followed by a long and unprecedented drouth, up until the 15th of September. On account of bad seed a great many planted the second time, the grub worm injured many fields. The wheat crop was light and not of the first quality, many fields only making from four to six and eight bushels per acre. Oats but a small acreage sown but very good. Timothy and clover good, a full average put up in fine condition and bringing good prices. Early planted potatoes a good crop; late ones almost an entire failure owing to bugs and the dry weather. Some succeeded in raising a half crop or more of Peachblows where planted late on sod or new ground, but had to wait until winter of ordinary years to dig them, and selling for more per bushel than the best of wheat. Clover as a fertilizer and for seed is becoming more extensively used every year, and its benefits are always apparent. The fruit crop was light, not sufficient for the home demand.

The great question for our farmers soon to decide will be the substitute for timber to fence their farms with, the timber of our country is being fast used up; Walnut is almost entirely gone and the Oak along the principal railroads will soon be gone with a large portion of the Poplar, Hickory, Ash and Elm. There is already quite an amount of wire used for fencing and contracts made for hedge fence. The counties composing this district are Parke, Putnam, Clay and Vigo, and all have regular organized county societies, and held fairs, with the exception of Putnam county.

The winter up till the 30th day of December has been unusually mild, a large amount of rainfall; wheat still growing and looking as green as in the spring of the year.

RECEIPTS AND EXPENDITURES.

Receipts from all sources	$2,341 38
Paid on premiums	1,403 00
General expenses	400 00
Permanent improvements	454 06
Leaving a balance of	$84 32

DEMPSEY SEYBOLD, Secretary.

CAMBRIDGE CITY AGRICULTURAL AND TROTTING PARK ASSOCIATION.

The grounds of the Cambridge City Agricultural Society are beautifully situated, adjoining the town of Cambridge City. Contains fifty-five acres, a mile track eighty feet wide, good stables, two amphitheaters, with seating capacity for three thousand persons, and all other necessary buildings.

Held no fair in 1881, and have not definitely determined whether will hold one this year. Some of the fairs previously held here were among the most successful in the State. We are situated in the midst of the best farming country in the State. The general intelligence, thrift and enterprise of our farmers is equal to any in the State. The wheat crop last year was up to the average, and the prospects of the growing crop is equal to that of the past twenty years. Corn an average crop. Potatoes not over half crop. Fertilization is receiving more attention each year. The hog, cattle, sheep and horse interests are gradually gaining each year. Fences are always a subject to attract attention. Our farms are well fenced; some wire is used. But if the law makers and farmers of this State think that they make more money to keep up fences and let stock run at large than to keep up stock and let fences go, we think they are sadly mistaken.

Our town is quite a manufacturing and railroad center, employment being given to over five hundred men. We have as good schools as there are in the State. Fine water power, equal to two thousand horse power. Healthy location. Low taxes. A church going people, and room for more.

GEO. W. SHULTS, Secretary.

DUNKIRK UNION.

The Dunkirk Union Fair Association held their annual fair at Dunkirk.

We met under favorable circumstances, the weather pleasant, and every department filled up with excellent material for a first class show. Our exhibition was a success. In our show of stock, and more particularly cattle, it was a grand showing both in quantity and quality. In other kinds of stock the entry books show an increased number of entries.

The floral department was, to say the least of it, a great credit to the energetic committee of ladies that presided over it, and the gentlemanly Superintendent that assisted them. One obstacle with which we had to contend was an old debt hanging over us. We are happy to inform the neighboring public that we paid our premiums in full last year and we are out of debt.

Our grounds are beautifully located one-half mile from center of town. A good half-mile track, and a beautiful grove covering about half of the inclosure. A good fence, ample buildings and pens, and stalls for the accommodation of stock on exhibition.

We think with fine weather each year and the cooperation of the citizens of the vicinity, mingled with the untiring energies of the Board of Directors our fair will rank favorably with any in our State.

CONDITION OF AGRICULTURE.

There is a marked improvement in agriculture each year. The ground is plowed deeper, the seed selected more carefully, the planting receives more attention and the cultivation is executed with a greater degree of precision and neatness. Not only this, but the fence must be in good order; and if the ground is not already dry it must be ditched, and nearly all farmers use the drain tile as this is the best method of draining land, and the two factories we have here in town and the several in the vicinity around us renders tile convenient as well as cheap. One of our factories is run by steam and makes from 3-inch to 8-inch tile. This enables farmers to get large tile for their outlets. This factory has shipped a great many tile in the neighboring counties within the last year.

The crops of grain here was, the last year, up to the average of preceding years. The crop of potatoes was like the fruit, nearly a failure. Nearly all of our fruit trees were more or less injured by the severe winter of the close of 1880 and beginning of 1881.

The wool growing interest is increasing. There has been a great many sheep killed within the last year, but we hope to see the new dog law rigidly enforced and we think we can give a different report next year.

We have but few good roads as yet, but our people are awake to this interest and are asking to be taxed to gravel a great many of the leading ones. Several are already granted and in a few years we can boast of our good and free gravel roads.

J. THOS. PATRICK, Secretary.

EDINBURG UNION.

The Edinburg Union Agricultural Society held their twenty-second annual fair on their grounds at Edinburg, September 20 to 24 inclusive.

The display in the floral hall was fully equal if not better than last year. The display of horses, cattle, hogs and sheep was very good, but not up to our usual standard. The number of entries in the different classes, excepting the miscellaneous department, fell a little short of former years.

The weather was favorable, and the attendance good the entire week.

Our crops were cut short by the drouth, but the high prices paid for corn and wheat enabled our farmers to realize a very fair per cent. for their labor and investment.

The condition of agriculture in our district is prosperous, and with the aid of our latest improved machinery, farming is being better carried on, and more profitable to all concerned.

Wheat and corn is our leading product. Rye, barley, clover and oats raised in limited amounts, but to no great extent.

The raising of cattle, short horn and for the market, is increasing yearly, and has become not only the means of improving their stock, but a source of large gains to a number of our farmers.

Our farmers, as a general thing, are in fair circumstances; and our farms are all well improved—good dwellings, large barns, good fencing, and well drained. Our farmers' dwellings are among the finest to be seen in the county. Our barns are large and substantially built.

Our fencing is composed of boards and rails. Very little wire fence to be seen.

Our roads are nearly all first class, eight of which lead into town, and only two of them "free pikes" or dirt roads.

The hard winter of '79 and '80, and the dry summer following, killed a large number of our fruit trees, and the fruit crop was almost a total failure.

In conclusion, I may say that agriculture is in a fair and prosperous condition, and our farmers are numbered among the wealthiest and most influential citizens.

J. A. THOMPSON, JR., Secretary.

FOUNTAIN, WARREN AND VERMILLION.

The twenty-second annual fair, under the direction of this society, was held at Covington, September 20, 21, 22 and 23, 1881. The success of this organization has been somewhat phenominal; there having never been a failure to meet its obligations during its entire existence. This year, however, as the date of the fair approached, the minds of the "faithful few" began to fill with apprehension. The Farmers' and Mechanics' Institute, of Danville, Illinois, fourteen miles west of Covington, had appointed the same date for their fair, and, as the Wabash divides our district, leaving the two counties Warren and Vermillion on the west side of the river, it was feared that the attraction of a fair in the populous and thriving city of Danville, would draw largely upon our usual attendance from those counties.

And then the weather! Would it rain? Would the equinoctial visit its fury upon us? Would the farmers get their wheat in? These and similar forebodings hovered about those who were feeling the responsibility of the enterprise. Moreover, on the first day of the fair, before any indication of the result could be attained, the impudent face of the "wheel of fortune man" and the "chuck a luck dealer" and the "hieronymous man" began to show themselves. Now, what to do with them; it had been the custom to admit them; the odium of the business had already attached; it was too late to get any financial benefit from refusing them admission; and then the opportunity to get two or three hundred dollars, and so fortify against the attractions of Danville was before us. With these matters to consider, the directors met under an oak tree on the grounds, and promptly by an *unanimous* vote determined to prohibit all games of chance. It was no revolution, bringing about a change of officers, or the result of popular clamor that produced this result. The men who voted on this measure were the old veterans who have nursed the association through its infancy, protected it while in its teens, and now, that it is "of age," are its warmest friends. And it is very evident that hereafter, decency and order shall rule on the Covington fair grounds unless a change of management should take place. The nimble-fingered gentry flitted away to more congenial climes and business opened.

The entries were in excess of those at the fair of 1880, and the excess was principally in the live stock and agricultural classes. The display of entered articles was fully equal to that of any former year in all particulars unless we except the speed ring. The premiums for speed were very light. The association has been severely criticised for not offering better premiums and attracting faster horses. On the other hand, the amount of jockeying and dishonesty so much indulged in by fast horsemen, is sufficient to disgust fair-minded people with offering any inducement to them. What the policy of future fairs may be it is impossible to predict.

The attendance during the fair of 1881 was very large, considerably above an average. The receipts, however, did not quite reach those of 1880. This is accounted for in the several facts that the gambling fraternity were excluded; the society was compelled, in view of the simultaneous occurrence of the Danville fair, to purchase the use of the toll bridge across the river and make it free during the fair, and further, the Danville fair itself undoubtedly withdrew *some* of the patronage which would have come to Covington, if they had chosen some other time. It was a very common remark to hear from those on the grounds that a more enjoyable fair they had never attended. The weather comported itself admirably.

The district represented by this organization is drained by the Wabash river for a distance of more than sixty miles, receiving in its course several large streams, notably, Big Shawnee and Coal creek, in Fountain county; Pine creek and Redwood in Warren, and Vermillion river in Vermillion county. A great portion of the alluvial lands bordering these streams is subject to overflow several times during the year, sometimes destroying the crops, as in 1880, and at other times preserving a crop, as in the past season, when, owing to the extreme dry weather, the fall crops on high lands, in a great measure failed. The large proportion of the "bottom" crop was safely gathered this fall, although the river "came out" about the middle of November. The yield of wheat in 1881 was below the average; all the late crops suffered severely from drouth. Potatoes and apples being almost an entire failure. Still, in the face of a partial failure of crops, there is little to indicate a hard year to a casual observer. Indeed, in the march of progress there seems to have been an unusually long stride taken.

In every direction, comfortable, and in many instances, commodious and expensive residences have been, and are being erected, while those who were already provided for in this respect, have been building great barns, and otherwise adding to the comfort and utility of their surroundings. The care of the soil is receiving greater attention, rotation in crops is being observed, and especially in the matter of under drainage, has there been a great advancement. There has undoubtedly been more drain tile laid during the last year than in any two former years; and, although the facilities for their manufacture have been greatly increased, it is believed that every factory is behind with its orders.

The improvement in the grade and quality of live stock while not very marked is still noticeable, and the attention given to this branch of farming will increase more rapidly than it has formerly done. As, also, in all probability, will dairy farming, fruit raising and other specialties in agricultural science. The development of the mineral resources of the district, which may be said to have but just begun, will unquestionably stimulate farming to the highest degree, as well as all other branches of industry. The subject of the mineral wealth of Fountain county will be fully treated by Dr. R. T. Brown in the Geological Report for 1881, as he was engaged in a geological survey of the county during the last summer.

The activity in railroad building in Fountain county during the past year has been remarkable; four different roads having been working their way through the county. The road, which for several years has connected Attica and Veedersburgh has been extended south to near the southern boundary of the county. Attica and Covington have been united by rail on the line of the old Wabash canal; this road will, in all probability be extended south to Terre Haute. Two narrow gauge roads are being constructed across the county from east to west; (one which has received the iron) from Frankfort in Clinton county to Veedersburgh, will be extended west in the direction of St Louis; the other passes through the southern tier of townships. These roads with the I., B. & W., and the Wabash roads will afford ample means of transportation.

It is gratifying to see, also, that as these outlets to the great world of commerce are being constructed, the subject of gravel roads, for home convenience, is assuming a more practical shape; and the necessity of permanent, solid wagon roads is impressing itself upon every community, in such a manner that action can not be much longer delayed. Considerable work is being done in some localities, but only a tithe of what is needed.

G. S. JONES, Secretary.

KNIGHTSTOWN UNION AGRICULTURAL SOCIETY,

Composed of the Counties of Henry, Rush and Hancock.

The twenty-ninth annual fair was held, commencing the last Tuesday in August, 1881, continuing four days.

The lease of the former fair grounds having expired with the close of the fair of 1880, and finding that they were not large enough to accommodate the growing demands for the pleasant and comfortable use of the society, it was necessary to make other arrangements for the future. The removal to other quarters involved a large expenditure of money, and there being less than $1,200 in the treasury the Board of Directors concluded to try to organize a joint stock society, composed of two hundred members, holding only one share each, and a constitutional provision that there be no dividends to stockholders, but that all profits or surplus should be used for the payment of larger premiums and improvements of the grounds.

This arrangement was successfully carried out, organization perfected, the whole number of subscribers secured and the stock paid up.

The Board leased for a term of fifteen years forty-two acres of ground one-quarter of a mile west of Knightstown, one-half of which is nicely shaded by a fine grove. The whole is inclosed by a substantial fence and permanent buildings were erected thereon; one of the improvements being a splendid half mile speed track fifty feet wide.

The premiums paid and expenses were in excess of last year, the latter increased by reason of the removal, yet we are happy to say that we paid cash in full for everything and had a small surplus left.

The display was a grand success quite equal to former years.

The entries were full in all departments except fruits and horticulture, the former on account of the destruction of the orchards by the severe winter, and the latter by the drouth of the summer.

The show of stock was very good in quality and fair in numbers.

The hog cholera having almost abated in this district, has induced their larger propagation than for several years during its prevalance.

Cattle raising still holds a large place in the district, and is growing larger each year. Short horns leading, but other favorite breeds are taking a start and gaining slowly. We have one farmer who has a zebra or sacred bull, which he crosses with the short horns and native stock. He claims favorable results, among others good meat of fine flavor, docility and good dairy qualities. They do not commend themselves for beauty on account of the peculiar formation or growth on their shoulders, but that disappears at about one-fourth blood, when they present a very trim and graceful build.

The heavy French draft horses have grown in favor and are largely bred, though but few colts have yet attained to a marketable age.

Poultry raising is still increasing, with good markets for all produced.

The agriculturalists of the district are in prosperous condition. They are bestowing their best energies and most intelligent efforts upon their labors with beneficial results, each year showing advancement and improvement in their profession.

The following statistics culled from the report of State Superintendent of Statistics for 1879, will show our productions, etc.

The average yield of the following crops per acre for 1879, is given for the three counties: Wheat, 19.76 bushels; corn, 33.47 bushels; oats, 20.36 bushels. In the report it shows Henry county giving the largest yield per acre, 54.85 bushels. But Rush county, which is as good a corn producer as Henry, shows only an average of 12.23 bushels, which is evidently incorrect, for if properly reported it would show an average of over 48 bushels in the three counties. The total production for the same year is given, wheat, 1,957,777 bushels; corn, 5,982,913 bushels; flaxseed, 140,968 bushels. Henry county assumes the first place over any county in the State on flaxseed, showing the largest yield, to-wit, 80,469 bushels, and Rush county stands second and Henry third in yield of corn.

The following is the number of each of the following kinds of stock named in the three counties: Horses, 22,545; mules, 1,081; cattle, 39,629; hogs, 133,302; sheep, 26,472. Henry county again takes the red ribbon in the largest number of hogs produced by any county in the State, viz., 56,643.

The district has 352 miles of railroad and 136 miles of toll roads.

The mechanical department was up to the usual standard, as is also the department controlled by the women, in which they exhibit their skill and industry. This latter department is managed by a committee of ladies similar to the State association, but was so done before the State Board adopted that plan, and we claim not to have copied from them but to have been pioneers in that manner, and find it to work well and recommend it to other societies.

The improvements made by the farmers of and on their farms are on the advancing scale. All are improving their buildings, etc., while many are building structures that vie with the towns and cities in elegance and costliness. Many houses are of brick with slate roofs, which are a feature of this part of the State.

Our district is extensively underdrained, and they still continue to put in large quantities of tile every year with great advantage.

The benefits to be derived from full and accurate statistics can not be fully understood until the people are educated up to their importance, but when they see they will be more anxious than ever for them.

GORDON BALLARD, Secretary.

LAWRENCE TOWNSHIP AGRICULTURAL SOCIETY.

The Lawrence Township Agricultural Society is so named because it was created for the benefit of Lawrence township, but its efforts have been so heartily seconded by the community that it now embraces in its territory portions of Marion, Hancock, Hamilton, Boone and adjoining counties. The first fair was held at No. 10 school house in 1879, and with but one week's notice the house was filled, and much of the adjoining yard occupied with articles and stock for exhibition. In 1880 the managers located the fair at Minnewau Springs and were successful beyond expectation. At each of these fairs no cash premiums were offered, but premiums were awarded and designated in the usual way, by ribbons. Encouraged thus by such a hearty support, a joint stock company was formed in the spring of 1881 to procure permanent grounds and to hold an annual fair. A beautiful grove of about twenty acres adjoining the town of Lawrence was leased and fitted up as best could be done in the limited time before the fair. The grounds are easily reached by the Bee Line Railroad, and good wagon roads. The natural beauties of the grove are remarkable, having hill and dale, level and plain, covered with a grand old forest of oak, beech, elm, sugar, etc. There is a beautiful stream, clear as crystal, fed by numerous springs, affording an abundance of water for man and beast. A tight board fence six feet high inclosing the grounds, a time track one-half mile in length (all in the shade), stalls for horses, cattle and mules, pens for sheep and hogs, and other improvements were made, costing about $1,000 in all. The fair was held on September 22, 23 and 24, and was a grand success in every way. The show of horses was very fine, of cattle good—short horns, Jerseys and grades were all represented. Sheep and hogs were good. Poultry good. But the agricultural, horticultural and women's departments "took the rag off the bush." The exhibits of corn, wheat and vegetables were said to beat anything ever made in the county, while that of horticulture and women's work, for quality and quantity, would be hard to equal, these alone filling a hall twenty-five by eighty feet. Our efforts have been crowned with success from the beginning. Why? Because our aim has been to run the affairs of the society for the benefit of the public and not to make money; to give a good show and accommodations as cheaply as possible. There were no charges this year except a gate fee of twenty cents. With this nominal sum we paid all the premiums in full, and had a surplus left. The Marion County Society held a fair with us and paid premiums on stock to the amount of $141.50, which helped us out considerably.

For further details I refer you to the statistical statement.

CONDITION OF AGRICULTURE.

Although our territory embraces portions of other counties, still I shall confine my statements to the township of Lawrence, Marion county.

This township contains nearly every variety of soil from the rich black loam to the tenacious white clay. Fall creek running diagonally across it from north-east to south-west, and Indian creek from the south-east, and joining Fall creek near the center of the township afford plenty of good water, gravel for roads, and an outlet for drainage. Along the creeks lie many spacious bottoms of rich land which produce good crops of corn, wheat and oats. On the hilly ground adjoining these bottoms are excellent pasture and timber lands. Though these hills are seldom so rough that they can not be farmed, and fine crops of wheat, corn, oats, etc., are raised, still owing to their liability to wash, the farmer has wisely left the greater part to pasture and timber. Back of the hilly ground lie gently undulating plains, on the highest points of which is found the clay soils, while in the lower portions or valleys are found the black soil, rich in vegetable mould. These plains are adapted to a great variety of crops, wheat, grasses, clover, oats, do best on the higher portions while corn is best grown on the black loam. In the southern south-eastern and north-western portions of the township are found rich black swampy lands, which prove to be mines of wealth when properly underdrained and produce immense crops of corn. Along the creeks abundance of gravel is washed out to make good and durable roads. No minerals except bog iron ore is known to exist in our township but we have some valuable mineral springs. The most noted of which is known as Minnewau, situated at Spring Valley.

DRAINAGE.

About one-third of our land is underdrained and much more is being done. Our farmers are a unit as to the benefit of underdrainage. The want of capital is the chief drawback. The drains are usually put about three feet deep and along the lower depressions of the field. No attempt at thorough underdrainage has as yet been attempted here. Six, seven and eight inch tile is usual for the mains and three, four and five for the laterals. Some few drains have filled, others washed out or froze out all on account of improper construction. Our tile is good and durable.

Wheat, corn, oats and hay are the principal field crops. Potatoes, beets, turnips, tomatoes, onions, cabbage, beans, etc., are raised in lesser patches. The latter are marketed in Indianapolis and afford quite an income.

Apples of fine quality and considerable quantities are raised here. Some orchards comprising over a thousand trees. More or less quantities of grapes, quinces, peaches, plums, and berries are raised with profit. Our upland clay is best for orchards. The trees ripen up their wood early in the fall and are of consequence more hardy. Fully 75 per cent. of the orchards set on the richer black soil were lost last winter while others situated on the higher clay soil suffered much less. The crops of wheat and oats fell some short of an average while hay and corn was about an average. The quality of the hay was never better. Corn would have been *more* than an average had farmers saved good seed corn. Much was planted the third time before a stand could be had. This was an immense loss to the farmer, especially this year when corn is high.

Hogs have been healthy with some few exceptions, but the crop is short. On inquiry I find that hogs that have been diseased this year have generally had the run of pasture through the season, with little other feed until fall, when they were generally penned and given all the dry corn they could eat. In the course of a week or ten days they would show disease. Did the sudden change in feed cause the disease?

Other stock has been healthy. The number of sheep has increased from 947 in 1880 to 1,420 in 1881, showing a *good* increase. During 1880 ninety-six sheep were killed by dogs, damage $288.50; in 1881 fifty-four were killed, damages $162. This favorable showing in the decrease of damages by dogs is due to the more careful attention to penning sheep at night and the slaughter of worthless dogs.

Farmers rely on the barnyard manure and clover to keep up the fertility of the soil. An immense amount of manure is wasted every year which is a great loss, and will begin to tell on the pockets of farmers in the near future. No commercial fertilizers are used to my knowledge. The

TIMBER

is fast becoming cleared off, probably one-fifth is still in timber. This township was once a magnificent grove of the best timber, such as poplar, oak, walnut, sugar, hickory, beech and ash. Stumps still standing of poplar, oak and walnut measure from four to seven feet in diameter.

Only a few here and there of those large kings of the forest remain standing, while the destruction still goes on. No attempt at planting trees for timber is being made, though the matter is thought to be important. I sometimes think that it would be a blessing if all the timber suitable for logs was cleared away. Why? Because it seems as if log-haulers choose the softest time in the whole year to haul their logs. And going on the road with from four to six horses and from two to six logs on the wagon, they destroy more roads at one trip than all the rest of the travel for a whole year. Why can there not be a law which would keep such teams off the roads in a soft time? In this township there are over one hundred miles of

ROADS,

about one-third of which is graveled. Though the dirt roads are far from finished roads, still they have been much improved the last year by the use of Pennock's road machine. This machine will do the work of thirty or more single horse scrapers, and do it much better. Wherever the roads are well graveled we have good durable ones. Roads that are underdrained, or that run through land underdrained, are much better the whole year than those where there is no drainage. Good roads can be procured by drainage and then graveling. The

EDUCATION

of our township is good. In the township are twelve schools with an enrollment of 621, and an average daily attendance of 411, during seven months. Three of these schools are graded, employing two teachers each. The advance in education has been very encouraging during the last few years. Our agricultural society has offered premiums at each fare for educational exhibit from the schools of the townships, with very gratifying results. At the last fair, nine of the twelve schools, were represented with a total of fifty-five entries, and the display was pronounced excellent by all. This in no inconsiderable degree has tended to awaken an interest in our schools, among teachers, pupils and patrons, thereby adding to their efficiency.

AGRICULTURAL SOCIETIES.

Besides this society, there is a Grange in our township, owning a hall, and meeting monthly. They appear to be prosperous. There are taken and read by the people of this township over 600 papers and periodicals, about 250 of which are agricultural.

The Virginia zigzag fence is the prevailing one, but where they become useless, board, hedge or barbed wire fences take their places. The last mentioned appears to be the fashionable one. Some are built of wire and boards; others with wire only. Those with a board at the bottom to keep out small pigs, and near the top to prevent stock from running against them are the best. Last winter damaged the hedge fences considerably here.

Land is worth from $20 to $100 per acre, according to situation, quality and improvement. Good land can be got for about $35 to $50, where the improvements are moderate.

Agricultural implements of the most approved patterns are coming into general use.

We discover a praiseworthy disposition among our people to beautify the homestead by the putting out of ornamental trees and shrubs, repair of fences, barns, gates, houses, etc. May the good work still continue.

W. B. Flick, Secretary

LOOGOOTEE DISTRICT.

I herewith send you a condensed report of the Loogootee Agricultural and Mechanical Association for the year 1881.

Our annual fair this year *was not* a grand success, the rain having completely flooded the district on Thursday and part of Friday of our fair. We had gone to a great deal of expense in the way of improving our grounds; also in the way of advertising, and had it not been for the rain of Thursday and Friday we would have had one of the best fairs, in all respects, ever had in this part of the State. The attendance on Friday afternoon and Saturday was very large, but our entries were cut down to nothing in comparison to what they would have been with favorable weather.

Notwithstanding all this we were able to pay all expenses in full, an old debt of $88 and fifty per cent. of premiums awarded, leaving the association unincumbered and a balance in the hands of the treasurer of $63.

The association owns forty acres of enclosed ground, well improved and well located. The grounds and improvements cost $5,000.

The season has been very dry, but we think we will be safe in saying that our district will average a half crop of corn. Many farmers threshed a full crop of wheat, while others within a stone's throw did not cut their crop. The hay crop of the district was never better. Farmers who had river and creek bottom ground raised an abundance of corn, while those on the hills made almost complete failures. Fall pastures were very good. We realize the fact that we are short one-half in agricultural products.

Grain growing and grazing are carried on at this time in the district more than anything else in the agricultural line. It is thought now that our soil is the best adapted to it, at least our farmers who make that a business are the most successful.

Other agricultural and mechanical pursuits are followed with flattering results. The timber of the district is of a profitable kind, and many are making it useful instead of rolling it into heaps and burning it as in past years.

For the last ten years the increase in the sales of wheat and stock in this district has been astonishing. We think it will not be an exaggeration to say that there was one day in 1880 that our grain-buyers bought more wheat than all the crop of 1870.

The most of our good farmers are taking an agricultural paper. They understand their business better by having informed themselves. We regard an agricultural paper for a farmer very essential to success.

Great improvements are being made each year in the way of good substantial farm buildings of all kinds, and substantial bridges and roads. However, there is yet much improvement to be made in that direction. There has been some improvements in the way of fencing and drainage, but we think our farmers are lacking more in this than anything else. Taking all things into consideration we think we can say that we never were in a more prosperous condition.

This being a dry year there are many poor in our midst that will have a close time, but our institutions are such and with us are so conducted that none need suffer. We have many men of means that are willing to help the honorable poor. We think that confidence is fully restored, and it is a settled fact that confidence is capital.

If our people continue to improve in all things as they have in the past, we see nothing to hinder our district from being as pleasant, profitable and happy a country as there is on earth.

C. S. WOOD, Secretary.

MIDDLE FORK DISTRICT.

The Middle Fork Agricultural Society held its annual fair August 15th to 19th inclusive.

The preceding fair was poorly conducted, consequently we had no credit. We paid expenses and fifty cents on the dollar on the premiums this year.

Our location for a joint fair is good, beautiful grounds and good accommodations. This organization is now out of debt. We are in the midst of a great agricultural section, wheat and corn being the principal productions.

The wheat crop was above the average; a great amount is being sown this fall also. Corn fair; oats poor; flax average; fruits of all kinds scarce. Market good.

The prospect for our fair for 1882 is good—much better than last year—to be held August 21st to 25th inclusive.

J. S. MILNER, Secretary.

NORTHEASTERN DISTRICT.

I have the honor to submit the following report of the Northeastern Indiana Agricultural Association for the year ending this 31st day of December, 1881.

The tenth annual exhibition of this Association was held on the society's fair grounds adjoining the town of Waterloo, DeKalb county, Indiana, on the 3d, 4th, 5th, 6th and 7th days of October, current year.

The weather, on which, to a great extent depends the success or failure of all fairs was not at all favorable, more especially the first and second days, it being very stormy and cold; the third day was better—though very damp, until about noon when it began to clear off and before night was comparatively good; but the great amount of rain that had fallen made the roads very bad, which without doubt, prevented many from attending who would have done so had it been otherwise.

As it was, we had properly only two days for the fair. The entries were good—all things considered—numbering 1,662, not including manufactured articles in the way of agricultural implements, musical instruments, carriages, etc., etc. The show of stock was fair, I think we had the finest exhibition of "Imported Heavy Draft Horses" ever seen in northern Indiana. Our agricultural department, considering the very dry season, was good.

The mechanical department was light, owing in great measure to the fact that no premiums were offered.

The display of fruit, especially apples was the finest we ever had on exhibition. In other fruits there was a fair display.

In our floral hall we had the largest and best display of textile fabrics ever had in any county or district fair in this part of the country.

The display of fine arts and musical instruments was unusually fine; also that of agricultural implements.

Financially our fair was a success. Our receipts were good, in fact large, notwithstanding the bad weather. The amount received for privileges sold was larger than ever; also the amount received for licenses.

The indebtedness of the Association has been reduced $826.88.

We have during the year erected two new buildings on our fair grounds: one for the use of stock exhibitors and one for the use of the officers of the Association, costing $266, and made other permanent improvements amounting in all to the sum of $345.

The great desire of the officers and stockholders is to reduce the indebtedness of the Association as fast as possible, to do so without in any way interfering with the standing and success of the Association.

There is no doubt that had the weather been favorable we should have had a far better showing, and as it is we feel grateful for the result.

A. R. Stevens, Secretary.

NEW ROSS UNION DISTRICT.

Includes the Counties of Boone, Montgomery and Hendricks.

Owing to the extremely dry and dusty weather of last August, the gate receipts of our fair did not equal that of 1880; but such is the growing reputation of the association, that the privileges sold and the stall rents, besides other receipts, enabled us to pay every dollar of the increased premiums; also to raise the premiums on herds of cattle fifty per cent.

The display of horses of every class might have challenged a State fair exhibit.

Heavy draft horses are becoming quite a desideratum as the number of gravel roads increases.

Of mules and jacks there was a slim exhibit, the demand for such stock being less than in former years.

The sheep and hog department was hardly equal to the exhibit in 1880; a fact mainly attributable to the extreme heat and dust, since our pens were ample and premiums liberal.

The poultry exhibit was so large and diversified that a hall 40x20 was given entirely to that use.

Self-binding reapers, improved wheat drills, farm wind mills, spring-toothed and revolving harrows, sulky plows, and dozens of minor improved articles for the farm and household, made up the mechanical department.

The floral hall showed, in its exhibit, the good taste and wonderful skill of the fair contributors to that department.

The horticultural display was as good as could have been expected, most of the summer fruits being gone and the fall fruits not yet developed.

Of grain and vegetables only a moderate show. Too dry for vegetables.

CONDITION OF AGRICULTURE.

There is an increase in acreage of wheat over last year of fifteen per cent. Considering the acreage and better appearance, we think the wheat prospect is thirty per cent. better than last year.

Many hogs are marketed in light condition this fall and winter. Cause, light corn crop. Some small strips of country that were favored by the local showers have good crops of corn.

Hay, except clover, was light. Oats none. Potatoes half crop.

Many apple orchards are dying, and it seems very difficult to get a young orchard to start. "Why is this thus?" Are the nursery men imposing on us? Is the climate changing? Do we underdrain too little? Are we ignorant of the proper mode of cultivation? *Will* some one tell us?

The fence problem is solving itself, rails giving way to posts and plank, these in turn to wire.

Forest tree culture receives no attention. Drainage is increasing at a wonderful rate. Gravel roads have taken a front rank in our line of improvements. Blasting out stumps and crushing bowlders with Ætna powder has become quite common.

No commercial fertilizers have been used by our farmers, but we note with satisfaction that they are giving much attention to manuring from the stable and barnyard.

We shall hail with joy the day when every man must call his dog home and collar him or be himself collared by the red-eyed law.

We shall not praise the beauty, convenience and ample accommodations of our fair grounds; they need it not, but to all we extend a hearty come, behold and welcome.

TIM. MILLER, Secretary.

RUSSELLVILLE UNION DISTRICT.

This society held their fair near Russellville, Putnam county, August 23d to 28th.

Owing to the severe drouth and scarcity of water for stock in the country, it was not a success financially, which has never been said before in the history of our association.

Notwithstanding the season was not favorable, our exhibition was creditable in many particulars. The show of horses was first-class; there being a large entry.

Jacks and mules were an improvement over our former exhibition.

Cattle show was small, but good in quality.

Hogs and sheep were not as numerous as usual, but good.

There is a growing interest manifested in the poultry business, there being a large display, and would compare with any county or district fair in the State.

The floral hall was filled with the finest specimens of ladies' work. The ladies deserve great credit for their exertion in making our floral hall so attractive and successful every year.

The display of agricultural implements was good.

The exhibition in the other departments was creditable, but could be improved.

CROPS.

The crops of 1881 were not as good as the former years; though the yield of wheat was not so large, yet it was good in quality. Corn crop was short, owing to the drouth; about one third of a crop. The most of our farmers will have to buy to take their stock through the winter. Oats, a failure. Hay, good. The grub worm has damaged many of our meadows so that they will have to be seeded down again. Potatoes yielded almost nothing, but in quality were fair. Cabbage was no account. Fruit—apples and peaches were a failure. Pears yielded two-thirds of a crop.

CONDITION OF AGRICULTURE.

The farmers of our community are alive to the advantages to be derived from systematic farming and raising good stock. Instead of harvesting seven or eight bushels of wheat from an acre, as was the case a few years ago, they are not satisfied with less than from fifteen to twenty, and raise as high as thirty-five bushels to the acre. A great deal of attention is paid by our farmers to clovering their lands and keeping it up which is of great benefit to successful farming. We have three tile factories within four miles, all of them well patronized. Underdraining is something that should be looked to by all good farmers, that our land should not lay idle for want of proper drainage. One good crop will pay for all labor and expense for the same. Little or nothing favorable can be reported of road improvements. Our people are anxiously waiting to see what the result will be when the new road law is enforced. There is a great deal of interest awakening in the minds of our people to have free gravel roads. The fencing material in this locality is diminishing year by year and farmers must soon realize the fact that the common rail fence must give place to something else. Hedge and barbed wire are being used to some extent. Taken as a whole the three counties that comprise our district fair will rank with any other counties in the State.

Farmers as a class are better off than any other portion of the community.

G. S. DURHAM, Secretary.

EXHIBIT OF THE AGRICULTURAL SOCIETIES OF INDIANA, 1881.

NAMES OF SOCIETIES.	PRESIDENT.	ADDRESS.	SECRETARY.	ADDRESS.	Acres in Fair Ground.	How Owned.	No. of Members.	Indebtedness.	Value of Grounds.	Value of Improvements.	No. of Volumes in Library.
Indiana State Board of Agr'l	R.M.Lockhart	Waterloo	Alex Heron	Indian'p'lis	36	Fee simple	16	$50,000	$100,000	$40,000	900
Allen County Fair Ass'n.	W. A. Kelsey	Kelseyville	W. Rockhill	Ft. Wayne	65	Leased	..	....	....	....	..
Bartholomew County Agr'l Soc	Dr. J. Wright	Columbus	Rich. Thomas	Columbus	28	Stock Co	30	None.	....	....	..
Blackford Co. A., H. and M. Ass'n	H. Moon	Hartf'd City	John Noonan	Hartf'd City	24	Leased	..	600	....	623	..
Boone County Agr'l Soc	J. M. Ball	Lebanon	J. S. Cobb	Lebanon	24	Stock Co	85	None.	2,500	1,500	15
Cass County Agr'l Soc	Geo. Zinn	Logansport	D. Tomlinson	Logansport	36	Leased	39	None.	5,000	10,000	..
Clark County Agr'l Soc	James Carr	Charlesto'n	A. J. Hay	Charlesto'n	16	Company	12	None.	3,000	Incl'ed	..
Clinton County Agr'l Soc	Jas. McDavis	Mulberry	J. Bayless, Jr.	Frankfort	40	County	27	450	8,000	2,000	..
Decatur County Agr'l Soc	W. Hamilton	Greensburg	F. M. Weadon	Greensburg	45	Society	30	None.	4,000	2,000	..
Delaware County A. and M. Soc.	J. L. Martin	Muncie	Frank Ellis	Muncie	41	County	24	2,000	7,000	2,000	..
Elkhart County Agr'l Soc	Albert Osborn	Goshen	J. W. Irwin	Goshen	27	Fee simple	500	800	2,500	2,000	..
Fayette Co. E., I. A. M. & T. P.A.	J. N. Huston	Connersv'le	A. B. Claypool	Connersv'le	27	Fee simple	7	....	8,000	4,500	..
Franklin County J. S. Agr'l Ass'n	J. M. Vawter	Brookville	M. A. Mess	Brookville	30	Lease	65	400	3,000	800	..
Fulton County J. S. A. and M. Soc	Vernon Gould	Rochester	W. H. C. Chinn	Rochester	20	Fee simple	289	1,747	2,500	1,500	..
Gibson County Hort., Agr'l Soc.	J. Davidson	Hazleton	J. C. Hastin	Princeton	26	Fee simple	300	....	2,600	2,500	..
Grant County Agr'l and Stock Soc	John Ratliff	Marion	D. S. Hogin	Marion	35	Fee simple	..	800	3,000	Incl'ed	..
Green County Agr'l Soc	D. L. Osborn	Linton	P. Schultz	Linton	18	Fee simple	100	590	650	2,000	..
Hamilton County A. and F. Ass'n	S. M. Smith	Engletown	W. C. Vance	Noblesville	30	Leased	200	500	....	4,000	..
Harrison County Agr'l Soc	David Jordon	Corydon	C. S. Hudson	Corydon	28	Stock Co	205	....	3,000	7,000	..
Henry County Agr'l Soc	Evan H. Peed	New Castle	W. W. Cotteral	New Castle	15	Joint Stock	30	....	4,500	500	..
Howard County J. S. Agr'l Ass'n	David Culver	Galveston	A. N. Grant	Kokomo	33	Fee simple	50	5,000	2,000	2,000	..
Jackson County Agr'l Soc	John Scott	Brownsto'n	J. H. Mattock	Brownsto'n	30	Lease	82	....	....	....	..
Jasper County Agr'l Soc	G. H. Brown	Ple's't Grov	Horace Jones	Rensselaer	20	Fee simple	130	95	1,000	1,500	..
Jay County A., H., I. J. S. Ass'n.	Jno. Schmuck	Portland	G. W. Miller	Portland	40	99 years' lease	120	....	3,000	3,500	..
Jefferson County Agr'l Soc	W. P. Graham	Madison	Gam I. Taylor	Madison	40	Driving Park	..	1,000	....	....	..
Jennings County Agr'l Soc	V. C. Meloy	N'h Vernon	C. D. Shank	N'h Vernon	32	Fee simple	32	800	4,000	3,000	..

EXHIBIT OF THE AGRICULTURAL SOCIETIES OF INDIANA—Continued.

NAMES OF SOCIETIES.	PRESIDENT.	ADDRESS.	SECRETARY.	ADDRESS.	Acres in Fair Ground.	How Owned.	No. of Members.	Indebtedness.	Value of Grounds.	Value of Improvements.	No. of Volumes in Library.
Johnson County Fair Ass'n	I. Thompson.	Franklin	L. U. Downey	Franklin	30	Stock Co	6	$3,000	$3,500	$500	. .
Knox County A. and M. Soc	H. A. Foulks.	Vincennes	Gerard Reiter	Vincennes	45	Fee simple	228	1,000	5,000	12,000	. .
Kosciusko County Agr'l Soc.	L. Riffle	Warsaw	J. N. Runyan	Warsaw	16	Stock Co	. .	2,500	4,000	800	. .
Laporte County Agr'l Soc	L. S. Fitch	Oakwood	G. C. Dorland	Laporte	30	County	8	3,500	. . . .	. . . .	. .
Lake County Agr'l Soc.	Geo. W. Clark	Lowell	G. I. Maillet	Crown Point	40	County	. .	. . . .	5,500	1,000	. .
Madison County J. S. Agr'l Soc	N. McCull'gh	Anderson	C. K. M'Cull'h	Anderson	30	Fee simple	6	. . . .	4,000	2,500	. .
Marion County A. and H. Soc	S. Johnson	Irvington	J. J. Billi'gsly	Indian'p'lis	. .	. . . .	125	. . . .	. . . .	. . . .	125
Montgomery County Agr'l Soc	J. N. Davidson	Whitesville	F. L. Snyder	Crawf'dsv'e	63	Fee simple	360	7,000	20,000	15,000	. .
Newton County Agr'l Soc	Geo. W. Clark	Beav'r Timb	Wm. Darroch	Marco	40	Leased	32	100	. . . .	1,000	. .
Noble County Agr'l Soc	W. W. Latta	Ligonier	J. H. Hoffman	Ligonier	23	Fee simple	67	. . . .	1,800	1,200	. .
Parke County Agr'l Soc	Jas. A. Allen	Rockville	D. H. Webb	Rockville	50	Leased	55	300	. . . .	4,200	. .
Perry County A. and M. Ass'n.	H. Ackerman	Rome	Flint Deweese	Rome	3	Stock Co	48	. . . .	300	900	100
Pulaski County A. and M. Ass'n.	H. Kittenger.	Winamac	Jerre Taylor	Winamac	20	Stock Co	50	. . . .	1,500	1,000	. .
Putnam County Agr'l Soc	R. M. Hazlett	Greencastle	A. Lockridge	Greencastle	. .	Leased for fair	. .	. . . .	. . . .	1,500	. .
Posey County Agr'l Soc	Wm. Richards	N. Harmony	L. Pelham	N. Harmony	23	Stock Co	301	. . . .	2,300	4,000	50
Randolph Co. A., H., M. Ass'n.	John Frazier.	Winchester	D. E. Hoffman	Winchester	22	Stock Co	159	795	2,000	1,000	. .
Ripley Connty Agr'l Soc.	R. Johnson	Elrod	E. H. Rowe	Osgood	23	Stock Co	20	. . . .	2,000	2,000	. .
Rush County Agr'l Soc.	E. King	Rushville	L. Link	Rushville	30	Stock Co	300	500	3,000	3,000	. .
Shelby County J. S. Agr'l Soc	John Blessing	Shelbyville	A. J. Gorgas	Shelbyville	45	County	178	. . . .	5,000	10,000	. .
Steuben County Agr'l Soc	A. W. Hendry	Angola	B. F. Dawson	Angola	32	Fee simple	202	400	2,500	5,500	. .
Tippecanoe County Agr'l Soc	Wm. Taylor	Lafayette	John S. Pettit	Fafayette	72	County	37	. . . .	. . . .	. . . .	. .
Tipton County Fair Company	J. T. Hunter	Shielville	Wm. Barlow	Tipton	25	Fee s. & p. l'se	47	1,600	1,000	900	. .
Vigo County Agr'l Soc	W. Be'uchamp	Terre Haute	D. M. Wallace	Riley	51	County	122	1,500	10,000	5,000	. .
Wabash County	W. Mason	Wabash	G. W. Pawling	Wabash	14	Fee simple	71	500	8,000	2,500	. .
Warren County Agr'l Soc	J. Goodwise	W. Lebanon	J. C. Miller	W. Lebanon	30	Fee simple	200	3,000	3,000	12,000	. .
Warrick County Agr'l Soc	W. L. Weller	Boonville	S. N. Taylor	Boonville	20	Lease	309	. . . .	1,000	250	. .
Washington Co. A., H., M., I. A.	J. A. Boorman	Farabus Sta	Fred L. Crow	Salem	30	Fee simple	134	4,320	3,210	7,091	. .
Wells County Agr'l Soc	N. Greenfield	Bluffton	J. R. Bennett	Bluffton	40	. . . .	. .	. . . .	. . . .	. . . .	. .
Whitley County Agr'l Soc	A. Trumbull	Col'bia City	T. R. Marshall	Col'bia City	22	Fee simple	50	. . . .	5,000	3,000	. .
Bridgeton Union	Jas. L. Rea	Bridgeton	D. Seybold	Bridgeton	15	Leased	16	. . . .	. . . .	1,000	. .

Cambridge City Agr'l Soc	A. B. Claypool	Connersv'le	G. W. Sheets	Camb'ge C'y	55	11 persons	11	1,500	10,000	3,000	. .
Edinburg Union	Geo. W. King	Edinburg	J. Tho'ps'n, Jr	Edinburg	56	Fee simple	275	3,760	6,000	5,000	. .
Fount'n, War'n, Vermil'n Ag. Soc	Oliver Shelby	Covington	Dr. G. S. Jones	Covington	30	Fee simple	924	. . . .	3,000	4,800	. .
Henry, Madison, Del. Agr'l Soc	N. R. Elliott	Mech'ics'rg	J. D. Farrell	Middletown	27	Fee simple	150	71	2,000	1,000	. .
Knightstown Union Agr'l Soc	J. W. Walker	Greenfield	G. Ballard	Knightsto'n	41	Leased	202	. . . .	. . . .	3,000	. .
Lawrence Tp., Marion Co. Ag. Soc	O. W. Vorhis	Lawrence	W. B. Flick	Lawrence	18	Leased	50	400	. . . .	1,500	. .
Loogootee A. and M. Soc.	Thos. Walter	Loogootee	Geo. Shenem	Loogootee	40	Stock Co	20	. . .	3,000	2,000	. .
Middle Fork Stock Company	John Young	Geetingsv'le	J. S. Milner	Middle Fork	26	Leased	25	. . . .	1,300	1,000	. .
New Ross Union Agr'l Soc.	J. Lockridge	Mace	Tim Miller	New Ross	28	Leased	51	114	. . . .	4,500	. .
Northern Indiana Agr'l Soc.	Aaron Jones	South Bend	C. G. Towle	Mishawak'e	40	County	200	. . . .	5,000	500	. .
Northeastern Indiana Agr'l Soc.	J. Chamberl'n	Waterloo	A. R. Stevens	Waterloo	33	Fee simple	139	2,338	3,300	10,000	43
Prairie Farmers' Agr'l Soc	J. H. Hunt	Medaryv'le	C. Garrigues	Francisville	15	Fee simple	150	700	600	800	. .
Union City A. and M. Soc	Harrod Mills	Greenv'le, O	T. Shockney	Union C'y	56	Lease	266	1,000	. . . .	1,200	. .
Russellville Union Agr'l Soc	J. Full'nwid'r	Browns Val.	G. S. Durham	Russellville	35	Lease	15	3,500	. . . .	1,700	. .
Switzerland and Ohio Agr'l Soc	Harvey Jack	Patriot	W. H. Madis'n	E. Enterp'se	25	Perpet'l lease	60	. . . .	. . . .	2,500	. .
Dunkirk Union Agr'l Soc	D. B. Moore	Dunkirk	J. T. Patrick	Dunkirk	21	Leased	50	. . . .	1,200	1,500	. .

EXHIBIT OF THE AGRICULTURAL SOCIETIES OF INDIANA, 1881—Continued.

NAME OF SOCIETY.	ENTRIES.																
	Horses.	Jacks and Mules.	Cattle.	Sheep.	Hogs.	Poultry.	Other Live Stock.	Total Live Stock.	Mechanical.	Agricultural.	Horticultural.	Textile Fabrics.	Fine Arts.	Natural History.	Educational.	All Other Classes.	Special.	Total.
Indiana State Board of Agr'l	293	21	184	319	287	224	...	1,328	2,000	534	134	980	...	33	...	...	...	5,009
Allen County Fair Ass'n.	90	2	85	95	35	180	...	487	...	101	301	200	40	...	...	...	...	1,129
Bartholomew County Agr'l Soc.	111	15	44	22	33	67	...	322	...	36	19	...	4	...	...	806	...	1,187
Blackford Co. A., H. and M. Ass'n	76	6	6	41	26	64	3	222	4	39	26	189	5	...	...	54	...	539
Boone County Agr'l Soc	242	22	26	77	34	35	...	436	56	14	...	455	60	...	...	114	...	1,135
Cass County Agr'l Soc	220	4	61	65	36	129	...	525	76	500	135	46	610	...	...	46	...	1,938
Clark County Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	250
Clinton County Agr'l Soc	285	10	73	54	84	126	...	632	40	140	40	240	105	...	...	375	...	1,572
Decatur County Agr'l Soc	158	20	24	59	70	20	...	351	135	84	...	56	...	...	...	578	...	1,204
Delaware County A. and M. Soc.	253	13	31	65	44	63	...	469	245	677	194	...	...	...	...	576	...	2,161
Elkhart County Agr'l Soc	135	4	30	12	17	14	5	217	55	52	13	80	16	...	...	...	...	433
Fayette Co. E., I., A., M. & T. P. A.	160	13	43	47	37	107	...	407	87	123	51	203	37	9	...	205	27	1,149
Franklin County J. S. Agr'l Ass'n	134	8	25	12	...	5	...	184	20	95	1	138	...	...	...	...	...	438
Fulton County J. S. A. and M. Soc	84	3	26	28	9	19	...	169	23	55	13	93	19	...	...	93	7	472
Gibson County H. and A. Soc	143	17	45	20	10	4	...	431	72	123	53	171	74	...	...	506	8	1,281
Grant County Agr'l and Stock Soc	113	14	61	81	20	36	...	325	50	200	41	231	51	...	...	...	...	698
Greene County Agr'l Soc	58	11	38	33	14	32	...	186	12	93	76	...	15	...	...	81	...	463
Hamilton County A. and F. Ass'n	165	18	52	59	54	92	...	440	70	133	80	52	349	...	...	135	176	1,435
Harrison County Agr'l Soc	378	24	44	54	42	56	...	598	40	242	62	85	29	...	...	430	...	848
Henry County Agr'l Soc	46	7	30	40	50	100	...	273	...	10	2	1	1	...	...	60	2	348
Howard County J. S. Agr'l Ass'n	126	19	27	35	58	23	47	335	105	83	51	123	43	...	...	57	...	797
Jackson County Agr'l Soc	89	8	24	23	5	20	...	169	27	86	4	32	26	...		84	...	428
Jasper County Agr'l Soc.	74	...	21	20	22	147	...	284	15	34	28	153	270	...	14	103	...	631
Jay County A., H., I. J. S. Ass'n.	81	2	50	60	50	25	..	268	83	40	35	130	270	...	...	124	...	980
†Jefferson County Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jennings County Agr'l Soc	24	8	36	83	52	25	42	340	38	52	...	57	...	...	...	308	...	1,135
Johnson County Fair Ass'n	150	19	46	34	30	65	...	344	126	175	45	273	99	...	...	158	...	1,212
Knox County A. and M. Soc.	130	17	48	36	5	73	...	309	46	87	...	80	276	...	...	1,112	135	2,047
Kosciusko County Agr'l Soc.	131	2	38	14	4	23	...	245	37	168	99	...	16	...	...	243	...	775
Laporte County Agr'l Soc	84	...	27	25	4	21	...	161	36	50	34	14	...	...	...	117	...	412
Lake County Agr'l Soc.	112	...	42	19	41	35	...	249	35	26	54	...	14	...	...	40	6	420

Madison County J. S. Agr'l Soc.	174	11	41	30	49	136	...	441	88	81	205	229	32	...	...	...	...	1,076
Marion County A. and H. Soc.	20	...	8	6	11	20	...	...	...	64	53	...	...	...	...	62	...	244
Montgomery County Agr'l Soc.	446	11	97	183	196	174	...	1,107	290	132	98	47	107	48	76	263	...	1,905
Newton County Agr'l Soc	109	8	15	8	26	31	2	199	2	34	10	30	24	...	...	92	...	590
Noble County Agr'l Soc	107	...	23	44	16	9	...	199	10	55	10	30	46	...	...	205	...	555
Parke County Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	943
Perry County A. and M. Ass'n.	33	1	...	...	...	10	...	44	1	616	100	...	2	...	...	...	...	763
Pulaski County A. and M. Ass'n.	62	8	16	18	11	21	...	136	1	99	21	42	6	...	...	33	6	354
†Putnam County Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Posey County Agr'l Soc	163	16	23	20	16	20	42	300	43	139	30	224	31	...	...	578	...	1,388
Randolph Co. A., H., M. Ass'n.	89	19	32	26	61	47	...	274	43	190	265	122	19	...	...	98	...	1,011
Ripley County Agr'l Soc.	151	16	23	54	32	42	*	318	18	44	74	295	5	...	...	123	...	877
Rush County Agr'l Soc	253	22	77	66	50	92	...	560	57	91	72	267	43	...	...	206	...	1,290
Shelby County J. S. Agr'l Soc	238	23	50	90	74	84	...	559	66	71	108	835	74	...	...	529	...	2,242
Steuben County Agr'l Soc	79	...	30	54	32	23	...	218	73	470	348	324	22	19	...	...	25	1,499
Tippecanoe County Agr'l Soc	196	3	189	143	164	240	...	935	225	146	32	...	...	...	...	693	...	2,031
Tipton County Fair Company	176	2	45	16	13	80	15	347	26	55	30	90	232	...	...	80	...	850
Vigo County Agr'l Soc.	116	...	36	17	28	72	...	269	114	111	138	30	124	...	...	398	249	1,050
Wabash County Agr'l Soc	270	20	79	65	77	189	...	700	75	310	...	...	...	...	...	1,118	...	2,128
Warren County Agr'l Soc	149	9	25	9	71	48	...	...	...	306	27	182	37	...	...	63	113	1,039
Warrick County Agr'l Soc.	107	22	26	17	20	19	...	211	192	91	40	...	...	...	...	400	...	934
Washington Co. A., H., M., I. A.	270	39	40	29	20	33	...	431	45	90	16	98	121	...	...	280	...	1,081
Wells County Agr'l Soc	105	6	10	25	37	6	...	189	9	57	13	150	32	...	...	...	...	440
Whitley County Agr'l Soc.	84	...	8	38	12	20	...	162	23	85	91	86	20	...	...	...	...	467
Bridgeton Union Agr'l Soc	128	8	...	46	46	51	...	279	54	124	54	220	226	...	...	...	...	...
†Cambridge City Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Edinburg Union Agr'l Soc.	156	32	63	43	54	42	...	390	130	130	52	79	22	...	...	1,098	...	1,901
Fount'n, War'n, Vermil'n Ag. Soc	62	12	40	31	43	35	8	231	52	108	46	93	309	...	...	551	5	1,395
Henry, Madison, Del. Agr'l Soc.	154	4	29	62	123	66	...	438	...	...	...	...	...	...	...	...	...	438
Knightston Union Agr'l Soc.	205	20	48	76	48	104	...	501	79	216	10	433	33	...	...	39	...	1.311
Lawrence Tp., Marion Co. Ag. Soc	63	6	38	17	20	38	...	182	15	256	55	277	...	...	55	21	...	861
Loogootee A. and M. Soc.	100	...	10	10	15	10	...	145	10	12	20	11	22	...	...	400	...	620
Middle Fork Stock Company	88	2	10	22	11	25	...	158	...	18	85	10	10	...	...	56	...	505
New Ross Union Agr'l Soc.	296	12	63	73	29	88	...	561	19	30	21	173	39	1	...	353	5	1,158
†Northern Indiana Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Northeastern Indiana Agr'l Soc.	86	2	55	38	38	73	...	291	57	185	318	276	91	...	...	344	...	1,662
Prairie Farmers' Agr'l Soc	53	2	14	10	10	8	...	97	56	17	15	...	...	...	...	82	...	267
Union City A. and M. Soc	107	6	42	47	89	28	15	334	155	246	175	137	17	...	...	598	...	1,562
Russellville Union Agr'l Soc	155	12	16	12	59	86	...	340	17	62	14	131	27	...	...	...	...	574
Switzerland and Ohio Agr'l Soc.	107	32	34	24	42	50	...	289	86	174	18	217	41	...	...	239	...	1,064
Dunkirk Union Agr'l Soc	109	...	57	33	119	75	...	...	20	65	275	150	...	...	...	...	...	903

*Display.

†No Fair.

EXHIBIT OF THE AGRICULTURAL SOCIETIES OF INDIANA, 1881—Continued.

NAME OF SOCIETY.	PREMIUMS PAID.																	
	Horses.	Jacks and Mules.	Cattle.	Sheep.	Hogs.	Poultry.	Other Live Stock.	Total Live Stock.	Mechanical.	Agricultural.	Horticultural.	Textile Fabrics.	Fine Arts.	Natural History.	Educational.	All Other Classes.	Special Premiums.	Total.
Indiana State Board of Agr'l	$2,589	$142	$1,370	$610	$640	$305	...	$5,656	...	$314	$405	$429	...	$51	...	...	...	$6,855
†Allen County Fair Ass'n	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bartholomew County Agr'l Soc	503	89	363	111	163	54	...	1,283	...	29	25	250	...	...	...	$1,129	...	2,468
Blackford Co. A., H. and M. Ass'n	229	12	10	88	59	37	$5	441	...	10	32	83	$2	...	...	41	...	608
Boone County Agr'l Soc	610	170	260	90	110	28	...	1,268	$70	65	174	50	...	...	...	86	$26	1,739
Cass County Agr'l Soc	1,376	34	292	84	66	102	...	1,954	102	226	101	6	220	...	...	21	...	2,629
Clark County Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	400
Clinton County Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2,296
Decatur County Agr'l Soc	865	77	312	78	205	12	...	1,549	149	38	...	39	...	...	...	209	...	1,984
Delaware County A. and M. Soc.	526	13	72	67	79	31	...	788	97	77	49	...	...	...	...	177	...	1,188
Elkhart County Agr'l Soc	166	8	72	14	36	7	...	303	8	21	16	25	10	...	...	...	871	1,254
Fayette Co. E., I. A., M. & T. P. A.	395	40	260	78	126	70	...	969	200	175	80	190	47	5	...	...	...	1,666
Franklin County J. S. Agr'l Ass'n	414	9	79	28	...	3	...	533	20	57	6	45	...	...	...	...	...	661
Fulton County J. S. A. and M. Soc	166	9	87	35	18	10	...	325	22	17	10	19	12	...	...	48	5	457
Gibson County H. and A. Soc	320	51	157	47	32	36	...	644	84	33	55	57	41	...	...	586	60	1,563
Grant County Agr'l and Stock Soc	247	15	164	126	23	25	...	600	56	72	40	160	60	...	...	...	500	1,488
Greene County Agr'l Soc	150	32	103	50	31	19	...	385	19	44	38	...	9	...	...	60	...	555
Hamilton County A. and F. Ass'n	357	32	168	76	144	32	...	809	20	59	46	17	135	...	...	49	200	1,336
Harrison County Agr'l Soc	75	12	23	16	17	27	...	...	25	65	22	32	12	...	...	200	...	426
Henry County Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1,200
†Howard County J. S. Agr'l Ass'n	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jackson County Agr'l Soc	427	28	65	45	11	13	...	589	39	36	3	17	23	...	...	156	...	863
Jasper County Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	999
Jay County A., H., I. J. S. Ass'n.	560	15	174	80	110	14	...	953	31	56	35	59	23	...	...	25	...	1,215
†Jefferson County Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jennings County Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1,980
Johnson County Fair Ass'n	205	22	68	39	49	14	...	397	88	41	5	37	15	...	...	...	...	581
Knox County A. and M. Soc.	542	91	379	100	23	106	...	1,241	107	66	...	110	156	...	...	862	93	2,035
Kosciusko County Agr'l Soc	308	3	139	16	9	...	...	485	17	47	26	...	12	...	...	500	200	1,288
Laporte County Agr'l Soc	534	...	127	39	16	13	...	726	...	46	25	6	15	...	...	121	...	939
Lake County Agr'l Soc.	266	...	131	53	116	25	...	492	...	13	...	20	9	...	...	383	20	1,044

Madison County J. S. Agr'l Soc	1,075	35	214	151	139	83	...	1,697	124	80	87	118	24	...	...	...	...	2,081
Marion County A. and H. Soc	75	...	14	24	15	...	...	142	...	32	36	...	...	...	...	36	...	245
Montgomery County Agr'l Soc	4,130	30	1,264	378	392	187	...	6,382	245	139	87	46	112	24	62	109	...	7,207
Newton County Agr'l Soc	430	26	41	16	21	24	350	561	3	16	8	5	5	...	...	33	...	631
Noble County Agr'l Soc	461	...	66	56	26	5	...	614	13	11	7	20	20	...	...	41	...	750
Parke County Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.	...	1,910
Perry County A. and M. Ass'n.	131	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	258
Pulaski County A. and M. Ass'n.	90	37	41	41	25	7	...	241	2	30	14	11	5	...	...	23	...	331
†Putnam County Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Posey County Agr'l Soc	480	46	148	41	50	300	1,033	1,828	99	62	24	89	24	...	...	115	...	2,242
Randolph Co. A., H., M. Ass'n	534	25	62	27	68	11	...	727	31	35	39	20	8	...	...	13	...	873
Ripley County Agr'l Soc	1,221	56	205	95	127	37	...	1,741	51	39	79	119	7	...	...	...	14	2,000
Rush County Agr'l Soc.	1,256	60	552	191	188	72	...	2,319	60	79	86	125	42	...	...	98	...	2,809
Shelby County J. S. Agr'l Soc	2,582	77	375	160	274	97	...	3,568	148	90	75	375	42	...	...	141	...	4,440
Steuben County Agr'l Soc	143	...	66	77	36	10	...	332	60	109	47	58	13	7	...	...	645	1,272
Tippecanoe County Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5,654
†Tipton County Fair Company	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Vigo County Agr'l Soc	428	...	376	50	119	87	...	1,060	206	131	195	51	94	...	...	2,291	447	3,209
Wabash County Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2,145
Warren County Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1,800
Warrick County Agr'l Soc	917	88	63	64	60	28	...	1,220	353	159	65	...	...	...	...	597	...	2,355
Washington Co. A., H., M., I. A.	1,472	90	90	51	54	15	...	1,772	67	23	15	45	53	...	...	152	...	2,126
Wells County Agr'l Soc	168	8	34	49	54	4	...	317	10	30	...	...	...	...	...	190	...	538
Whitley County Agr'l Soc	300	40	100	40	20	...	...	500	20	40	40	40	20	...	...	...	...	660
Bridgeton Union Agr'l Soc	748	24	...	87	112	29	...	1,000	69	47	40	112	141	...	...	...	...	1,369
†Cambridge City Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Edinburg Union Agr'l Soc.	981	96	307	233	182	38	...	1,837	264	114	29	33	17	...	...	396	...	2,090
Fount'n, War'n, Vermil'n Ag. Soc	386	53	207	36	98	26	...	806	87	52	19	29	138	...	...	120	15	1,265
Henry, Madison, Del. Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	965
Knightstown Union Agr'l Soc	713	51	328	159	173	51	...	1,475	141	98	18	237	31	...	...	...	...	2,000
Lawrence Tp., Marion Co. Ag. Soc	227	12	41	22	23	14	...	349	...	16	20	...	...	...	...	19	...	403
†Loogootee A. and M. Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Middle Fork Stock Company	130	4	31	18	16	8	...	207	...	11	43	5	5	...	...	32	...	298
New Ross Union Agr'l Soc.	1,489	29	338	65	60	25	...	2,006	11	34	13	140	36	1	...	126	...	2,355
†Northern Indiana Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Northeastern Indiana Agr'l Soc.	302	4	248	45	45	27	...	671	...	22	12	142	118	...	...	111	...	1,076
Prairie Farmers' Agr'l Soc	235	4	41	16	20	5	...	321	...	16	14	7	...	...	...	38	...	395
Union City A. and M. Soc	414	25	98	94	128	14	13	786	52	100	17	20	12	...	...	177	1,135	2,299
†Russellville Union Agr'l Soc	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Switzerland and Ohio Agr'l Soc	599	67	157	54	88	51	...	1,016	142	106	18	140	49	...	...	109	...	1,579
Dunkirk Union Agr'l Soc	450	...	150	40	175	14	...	...	...	110	20	16	...	...	...	40	...	1,015

† No Fair

* Good.

EXHIBIT OF THE AGRICULTURAL SOCIETIES OF INDIANA, 1881—Continued.

NAME OF SOCIETY.	RECEIPTS.						DISBURSEMENTS.						
	Admission Fees.	From License Fund.	Entry Fees.	Privileges Sold.	All Other Sources.	Total.	Rent and Old Debts.	Improvements.	Salaries.	Premiums.	Expenses of Fair.	Other Accounts.	Total.
Indiana State Board of Agr'l	$17,153	. . . .	$620	$2,004	$24,282	$44,059	$16,789	$2,809	$1,650	$6,856	$3,816	$12,143	$44,059
Allen County Fair Ass'n	7,500	. . . .	. . . .	1,500	500	9,500	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .
Bartholomew County Agr'l Soc	1,381	$15	604	923	517	3,440	. . . .	. . . .	. . . .	2,469	972	. . . .	3,440
Blackford County A., H. and M. Ass'n.	625	25	121	108	724	1,603	811	23	. . . .	601	62	171	1,667
Boone County Agr'l Soc	1,600	15	15	449	205	2,284	. . . .	. . . .	. . . .	1,739	545	. . . .	2,281
Cass County Agr'l Soc	3,431	. . . .	306	725	433	4,896	1,364	. . . .	. . . .	2,629	866	. . . .	4,859
Clark County Agr'l Soc.	. . . .	. . . .	. . . .	. . . .	. . . .	625	. . . .	. . . .	. . . .	400	. . . .	. . . .	555
Clinton County Agr'l Soc.	2,376	. . . .	250	294	400	3,320	98	323	100	2,296	938	32	3,786
Decatur County Agr'l Soc	1,634	. . . .	369	614	207	2,824	. . . .	. . . .	116	1,981	481	. . . .	2,582
Delaware County A. and M. Soc	1,206	60	68	274	234	1,842	135	100	135	1,188	100	100	1,758
Elkhart County Agr'l Soc	1,592	49	246	270	98	2,255	8	13	. . . .	1,019	. . . .	271	1,311
Fayette County E., I., A., M. & T. P. A.	2,556	. . . .	485	376	. . . .	3,418	. . . .	175	225	1,666	265	205	2,536
Franklin County J. S. Agr'l Ass'n.	568	30	136	217	127	1,078	150	35	40	661	150	33	1,070
Fulton County J. S. A. and M. Soc.	879	50	31	141	10	1,111	280	44	60	454	235	. . . .	1,073
Gibson County H. and A. Soc	2,244	30	64	328	647	3,414	. . . .	466	125	1,564	494	95	2,744
Grant County Agr'l and Stock Soc.	1,925	50	148	340	50	2,513	600	125	75	1,488	200	8	2,496
Greene County Agr'l Soc	525	. . . .	46	115	40	726	. . . .	344	50	167	240	15	816
Hamilton County A. and F. Ass'n	. . . .	. . . .	. . . .	. . . .	. . . .	1,774	. . . .	100	200	1,336	100	20	1,756
Harrison County Agr'l Soc	1,761	10	. . . .	210	917	2,898	. . . .	740	125	1,104	376	30	2,376
Henry County Ag'l Soc.	. . . .	20	. . . .	. . . .	. . . .	2,700	150	250	5	1,200	250	. . . .	1,855
Howard County J. S. Agr'l Ass'n	625	80	. . . .	211	215	1,130	. . . .	. . . .	. . . .	. . . .	. . . .	1,154	1,154
Jackson County Agr'l Soc	661	45	228	334	92	1,360	236	. . . .	. . . .	863	261	. . . .	1,360
Jasper County Agr'l Soc	923	40	274	123	41	1,401	. . . .	. . . .	30	999	467	. . . .	1,496
Jay County A., H. and I. J. S. Ass'n.	1,829	20	286	395	42	2,571	. . . .	694	350	1,072	215	. . . .	2,330
*Jefferson County Agr'l Soc	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .
Jennings County Agr'l Soc.	1,540	780	548	. . . .	82	2,954	. . . .	. . . .	. . . .	1,980	275	. . . .	2,255
Johnson County Fair Ass'n	791	. . . .	257	559	. . . .	1,607	. . . .	100	75	581	851	. . . .	1,607
Knox County A. and M. Soc	2,028	80	518	1,084	214	3,924	. . . .	. . . .	450	2,634	287	663	4,034
Kosciusko County Agr'l Soc	1,859	30	291	121	116	2,417	. . . .	620	25	1,088	610	. . . .	2,343
Laporte County Agr'l Soc	700	65	244	72	71	1,153	240	112	50	939	102	. . . .	1,443
Lake County Agr'l Soc	756	. . . .	300	126	. . . .	1,182	. . . .	. . . .	. . . .	1,044	138	. . . .	1,182

Madison County J. S. Agr'l Soc	3,002	30	415	560	309	4,316	896	....	440	2,081	460	....	3,877
Marion County A. and H. Soc	....	290	....	....	....	290	....	....	25	....	....	....	25
Montgomery County Agr'l Soc.	10,417	133	1,937	1,025	162	13,704	....	721	300	7,207	428	490	9,146
Newton County Agr'l Soc	627	45	144	142	146	1,105	172	120	....	631	182	....	1,105
Noble County Agr'l Soc	679	90	126	75	131	1,101	....	....	75	749	85	97	1,006
Parke County Agr'l Soc	....	....	....	....	....	2,870	....	....	....	....	....	....	2,440
Perry County A. and M. Ass'n	345	30	65	42	314	797	....	100	66	258	330	....	754
Pulaski County A. and M. Ass'n.	592	....	....	88	72	752	....	....	50	331	264	....	645
†Putnam County Agr'l Soc.,	....	....	....	....	....	....	....	....	....	....	....	....	....
Posey County Agr'l Soc	1,377	1,004	496	....	91	2,969	....	....	180	2,242	1,351	....	3,773
Randolph County A., H. and M. Ass'n.	633	20	177	145	149	1,124	....	....	....	873	210	....	1,083
Ripley County Agr'l Soc	1,973	20	510	600	124	3,227	....	300	50	2,050	300	100	2,800
Rush County Agr'l Soc	2,896	....	615	611	263	4,385	517	1,234	311	2,809	300	146	5,317
Shelby County J. S. Agr'l Soc	2,988	....	1,287	935	484	5,691	....	....	280	4,440	478	....	5,198
Steuben County Agr'l Soc	1,150	....	310	302	183	1,945	24	330	50	272	146	....	1,822
Tippecanoe County Agr'l Soc	....	....	....	....	....	10,637	....	....	....	....	....	....	10,629
*Tipton County Fair Company	....	....	....	....	....	....	....	....	....	....	....	....	....
Vigo County Agr'l Soc	1,655	155	977	521	2,675	5,984	750	682	239	2,862	538	887	5,980
Wabash County Agr'l Soc	2,581	64	395	410	203	3,658	45	371	437	2,145	614	150	3,762
Warren County Agr'l Soc	2,100	250	200	260	110	2,920	100	150	100	1,800	1,000	150	3,300
Warrick County Agr'l Soc	1,076	....	300	884	103	2,463	11	60	145	566	59	63	904
Washington County A., H. and M. I. A.	1,599	25	600	268	346	2,839	....	7,091	50	2,126	200	855	10,323
Wells County Agr'l Soc.	887	....	....	103	288	1,278	150	209	80	538	236	....	1,214
Whitley County Agr'l Soc	650	....	80	100	20	850	....	100	....	650	50	....	800
Bridgeton Union Agr'l Soc	1,303	....	144	243	651	2,341	....	450	60	1,403	344	....	2,257
*Cambridge City Agr'l Soc	....	....	....	....	....	....	....	....	....	....	....	....	....
Edinburg Union Agr'l Soc	1,688	30	532	1,076	908	4,234	33	....	100	2,690	726	....	3,549
Fountain, War'n and Vermil'n Ag. Soc.	1,948	35	88	457	1,176	3,705	....	852	150	1,265	389	328	2,985
Henry, Madison and Del. Agr'l Soc	1,118	....	102	315	171	1,707	81	200	125	965	335	....	1,707
Knightstown Union Agr'l Soc	2,240	....	393	751	199	3,584	300	3,000	730	2,000	500	....	3,530
Lawrence Tp., Marion Co. Agr'l Soc	351	....	45	51	141	588	....	725	30	403	156	....	1,314
Loogootee A. and M. Soc	668	20	100	255	92	1,171	88	....	464	232	....	323	1,107
Middle Fork Stock Company.	486	35	82	180	....	782	....	....	90	402	291	....	783
New Ross Union Agr'l Soc	2,734	....	200	791	500	4,223	....	140	275	2,355	493	1,073	4,336
*Northern Indiana Agr'l Soc	....	....	....	....	....	....	....	....	....	....	....	....	....
Northeastern Indiana Agr'l Soc	3,117	85	382	807	2,751	7,142	3,063	345	245	1,076	2,358	....	7,087
Prairie Farmers' Agr'l Soc	290	....	106	89	70	555	36	....	38	395	85	....	555
Union City A. and M. Soc	1,797	7	570	444	634	3,453	751	215	....	2,289	524	....	3,779
*Russellville Union Agr'l Soc	....	....	....	....	....	....	....	....	....	....	....	....	....
Switzerland and Ohio Agr'l Soc	1,357	....	290	289	175	2,011	40	70	125	1,579	380	222	2,417
Dunkirk Union Agr'l Soc	....	216	....	....	....	1,250	....	....	....	....	....	....	1,085

*Societies failing to report are omitted from the above exhibit.

†No fair.

INDIANA, 1881.

The Agricultural season of 1881 will be memorable as one of extremes. The severe and protracted winter, then the change to summer weather, without the usual spring season, and the wonderful rapid growth of vegetation, the extreme and unprecedented amount of hot weather, followed by a long and continued drouth of two months duration, causing a short crop of corn and potatoes, and in many places destroying pastures, so that farm stock required feed in August as in mid winter. The dry season ended about the middle of September by copious rains, and seasonable weather extending late in the season, followed by a remarkably open winter, thus giving excellent fall pastures, and favorable to seeding of the wheat crop, and prevented the serious results that were feared from the drouth. The coldest weather was 6° below zero, and ninety-six days below the freezing point. The warmest weather 101°, and thirty-one days about 90°, with one hundred clear days—one hundred and forty-nine fair days—one hundred and twenty-five cloudy days—one hundred and twelve days on which rain or snow fell to the amount of 48.74 inches, with the prevailing direction of the wind southwest.[*]

The foregoing reports from the county and district agricultural societies of the State show the interest in the annual fairs to be on the increase. The social advantages of these annual gatherings are recognized by the large attendance, and the importance of them demonstrated by bringing together the improved stock and machinery for comparison; and in thrifty localities the fairs are now considered indispensable to the welfare of the community. The reports show a prosperous condition of the farming community by general improvements and a higher state of cultivation facilitated by a wonderful amount of tile draining, thereby utilizing the very best lands for production.

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[*] We are indebted to Otto Schultze, Observer U. S. A. Signal Station at Indianapolis, for the full and complete meteorological tables in the front part of this book, from which we take the above extracts. SECRETARY.

By reference to the foregoing tables we find that the Montgomery County fair at Crawfordsville is the most successful one in the State (next to the State Fair), judging from the amount of receipts, being $13,704. Next on the list is Tippecanoe county fair at Lafayette; receipts, $10,673. Third in order is Vigo county fair at Terre Haute; receipts, $5,983. Fourth is Shelby county fair at Shelbyville; receipts, $5,694. Fifth is Cass county fair at Logansport; receipts, $4,896. Sixth is Rush county fair at Rushville; receipts, $4,385. And seventh on the list is Madison county fair at Anderson, the receipts being $4,315.

In the list of district fairs the Northeastern Agricultural Fair at Waterloo, De Kalb county, is first, the receipts being $7,042. The Edinburg Union in Johnson county next showing up receipts of $4,234, and the New Ross Agricultural Union in Montgomery county shows receipts of $4,223.

[*] The Bureau of Statistics, now in the third year of its existence, is in charge of the Hon. John B. Conner as chief, and Capt. J. T. Campbell as assistant. It is managed with remarkable efficiency, has control of the figures in reference to the agricultural products of the State, and will make monthly crop reports in the growing season.

The local reports to the Bureau are furnished by the Township Trustees (1,100 in number,) who are paid for such labor, thus making them of the most reliable character, and differing in this respect from any other State, especially in the mode of collecting such information.

From advance sheets of the report for 1881, kindly furnished by the Bureau, we continue the table of Comparative Statistics here appended, and make a few extracts.

CORN.

The short corn crop has been seriously felt in the middle and southern portions of the State; many farmers being compelled to purchase corn at from seventy to ninety cents per bushel to keep their stock in condition and in many cases to sell off a portion, being too expensive to keep.

In the northern part of the State, many places usually too wet for a good yield of corn, produced the best crop ever known in that section and which brought high prices.

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[*] It is due to the management of the Bureau of Statistics to state that they have experienced great difficulty and discouragement in its inception from failures to report, and indifference as to accuracy by those on whom they depended for estimates, which is in a great measure remedied by procuring the acreage from the Assessor's reports in April, and estimates of average yield from the Township Trustees, on which is based the calculation for the amount of the crop soon as produced.

Comparative Yields.

*1881	89,591,444 bushels	3,626,909 acres	24.7 bush. per acre.
1880	80,990,696 bushels	3,130,327 acres	25.8 bush. per acre.
*1879	71,387,075 bushels	3,135,178 acres	22.8 bush. per acre.

The principal corn producing counties of the State for the year 1881, are as follows:

Benton county produced	2,477,343 bush	average, 31.5 bush. per acre.
Tippecanoe county produced	1,827,996 bush	average, 24.5 bush. per acre.
Rush county produced	1,533,121 bush	average, 26.6 bush. per acre.
Hamilton county produced	1,526,725 bush	average, 29.7 bush. per acre.
Randolph county produced	1,525,167 bush	average, 26.5 bush. per acre.
Jasper county produced	1,517,043 bush	average, 36.4 bush. per acre.
White county produced	1,415,839 bush	average, 29.2 bush. per acre.
Clinton county produced	1,353,102 bush	average, 26.5 bush. per acre.

WHEAT.

The crop of 1881 was very satisfactory, considering that for the years 1875, 1876 and 1877 the wheat crops were comparative failures and of poor quality, the repetition of which was so discouraging that the raising of wheat was abandoned in many portions of the State. However, the crop of 1878 was good compared with the crops of the years stated, and give encouragement to that interest, which has continued to increase as to acreage, and the quality is improved so much that Indiana wheat commands a premium in the eastern markets.

The Bureau of Statistics shows the wheat crop of Indiana for three years as follows:

†1881	30,625,668 bushels	3,210,547 acres	9.5 bushels per acre.
1880	47,130,684 bushels	3,109,845 acres	15.2 bushels per acre.
‡1879	41,325,364 bushels	2,500,082 acres	16.5 bushels per acre.

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* The United States Census gives the corn crop of Indiana for 1879 at 115,482,300 bushels, from 3,678,420 acres, thus making the average at 31.4 bushels per acre, a difference of 25,890,856 bushels, in favor of Indiana as a corn producing State, and 6.6 bushels more than the average yield per acre, as reported through the Bureau of Statistics.

The corn crop of 1870 was 51,094,538, showing an increase in ten years of 64,387,762.

The National Department of Agriculture at Washington estimates the corn product of Indiana for 1881, at 79,618,000, from 3,657,800 acres, an average of 21.8 bushels per acre, and gives the average price at sixty cents per bushel.

† The National Department of Agriculture at Washington estimates the wheat crop of Indiana for 1881 at 31,353,000 bushels from 2,903,100 acres, the average yield 10.8 bushels per acre, showing uniformity and probable correctness by the close comparison with the Indiana Bureau of Statistics.

‡ The United States census shows the wheat crop of Indiana for 1879 to be 47,284,853 bushels from 2,619,695 acres, thus making the average 18.8 bushels per acre. The census of 1880 gave the wheat crop at 27,747,222, showing a gain of 19,557,631 bushels in ten years.

The principal wheat producing counties in Indiana are as follows, for 1881:

Allen county	679,939 bushels	12. bushels per acre.
Montgomery county	677,629 bushels	12.9 bushels per acre.
Clinton county	652,849 bushels	12.6 bushels per acre.
Tippecanoe county	612,566 bushels	9.5 bushels per acre.
Shelby county	609,847 bushels	9.6 bushels per acre.
Wabash county	608,950 bushels	13.5 bushels per acre.
Huntington county	595,263 bushels	13.8 bushels per acre.
Miami county	584,766 bushels	12.4 bushels per acre.
Jay county	579,710 bushels	14.2 bushels per acre.
Henry county	560,243 bushels	12.6 bushels per acre.
Howard county	550,536 bushels	13.9 bushels per acre.

OATS.

The production of oats is steadily on the increase, and improved in quality of late years. The Bureau of Statistics reports as follows for 1881:

*Indiana	14,398,617 bushels from 580,279 acres	24.8 bushels per acre.
Lake county	528,783 bushels	26.1 bushels per acre.
Benton county	515,093 bushels	33.1 bushels per acre.
White county	458,092 bushels	30.2 bushels per acre.
Allen county	447,655 bushels	28 bushels per acre.
Randolph county	400,590 bushels	31.2 bushels per acre.

BARLEY.†

The product as reported is 526,364 bushels, from 26,238 acres—20 1-10 bushels per acre. The leading counties in this cereal are:

Dearborn county	97,186 bushels	5,062 acres.
Franklin county	68,913 bushels	3,371 acres.
Shelby county	60,589 bushels	1,955 acres.
Wayne county	33,450 bushels	1,373 acres.
Randolph county	15,762 bushels	990 acres

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* The national department at Washington estimated the oat crop for Indiana at 15,711,000 bushels and 683,000 acres; average yield per acre, 23 bushels.

† The national department at Washington estimates the barley crop of Indiana for 1881 at 385,000 bushels; 14,800 acres; an average of 26 bushels per acre.

RYE.*

This crop seems to be the least grown of any of the cereals. The product is reported at 208,912 bushels, from 15,839 acres; an average yield of 13 1-5 bushels per acre:

Madison county	28,660 bushels from	1,786 acres.
Lake county	15,524 bushels from	1,077 acres.
Pulaski county	12,902 bushels from	848 acres.
Newton county	10,534 bushels from	681 acres.
Jasper county	8,965 bushels from	685 acres.
Porter county	5,852 bushels from	455 acres.
White county	5,610 bushels from	412 acres.

POTATOES.

The potato crop of 1881, although considered a failure generally, does not so appear for the State, from the figures as follows:

1880	3,047,726 bushels	72,737 acres	average, 41.9 bush. per acre.
1881	2,386,251 bushels	72,314 acres	average, 33 bush. per acre.

Spencer county	97,873 bushels	an average of 47.6 bush. per acre.
Allen county	80,831 bushels	an average of 32.2 bush. per acre.
Porter county	72,847 bushels	an average of 32.9 bush. per acre.
Laporte county	63,686 bushels	an average of 35.4 bush. per acre.
Gibson county	59,509 bushels	an average of 48.7 bush. per acre.

TOBACCO.

Indiana ranks eleventh as a tobacco producing State. The census gives the crop of 1879 at 8,872,842 pounds from 11,955 acres; average yield, 742 pounds per acre. The crop of 1870, was 9,325,392 pounds, which shows a decrease in the production of 452,550 pounds in ten years.

The Bureau of Statistics reports the crop of 1881 at 6,565,782, from 13,615 acres, an average yield of 482 pounds per acre. All but eleven counties of the State report more or less tobacco raised. The principal crop is from—

Spencer county	1,694,429 pounds	3,785 acres	average 447 pounds.
Warrick county	1,579,691 pounds	3,234 acres	average 448 pounds.
Switzerland county	869,770 pounds	1,684 acres	average 512 pounds.
Dubois county	369,614 pounds	1,071 acres	average 345 pounds.
Pike county	361,698 pounds	711 acres	average 509 pounds.
Jefferson county	223,698 pounds	406 acres	average 551 pounds.
Wayne county	191,636 pounds	317 acres	average 604 pounds.

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*The department at Washington estimates the rye crop of Indiana for 1881 at 249,000 bushels, from 24,400 acres; average 10.2 bushels per acre.

From advanced sheets of the census, kindly furnished, and Rand & McNally's Indexed Atlas of the World, we are permitted to copy some matter of general interest in regard to Indiana.

There were raised in 1880: 54,122 bushels of buckwheat; 401,130 bushels of flax seed; 1,910,601 peach trees which bore 4,241,445 bushels; the orchard products were valued at $2,858,086; market garden products at $487,479; forest products at $2,858,086; slaughtered animals at $37,000,000. There were made, 22,905,385 pounds of butter; 283,807 pounds of cheese; 1,332,332 pounds of maple sugar; 227,880 gallons of maple molasses; and 395,278 pounds of honey. The wool clipped was 5,629,023 pounds. The average value of cleared land was $20.46. The acreage of plowed land and meadows is 9,297,076, and of pasture land 2,108,501.

The gross number of farms in Indiana in 1880, was 194,013; in 1870, 161,289; in 1860, 131,826; in 1850, 93,896. Of which there was occupied by owners, 147,963; rented for money, 8,582; rented for shares of produce, 37,468. There was 200 farms under 3 acres each; 4,663 of 3 and under 10; 8,019 of 10 and under 20; 43,403 of 20 and under 50; 64,030 of 50 and under 100; 72,103 of 100 and under 500; 1,320 of 500 and under 1,000; 275 of 1,000 and over.

The soil is very rich and well adapted to the growth of all products of the temperate zone. In the southeast division it consists of a porous clay, rich in lime, and north of an east and west line drawn through Indianapolis of a very rich drift loam on a strong clay subsoil. The most fertile lands are those in the valleys of the rivers, Wabash, White and White Water, and few States have so little waste land. There is some marsh country in the north but this is being drained and brought under successful cultivation.

About one-eighth of the State is prairie and one-third forest land. The timber consists of oak, beech, hickory, sugar-maple, ash, black walnut, poplar, elm and sycamore, and an extensive lumber trade is carried on.

The average value of woodland per acre is twenty-six dollars and ninety cents.

The dairy interest of Indiana is large and increasing, and the splendid pasturage of its prairie lands furnishes sustenance for large numbers of farm animals.

Pork packing is carried on to a large extent in this State as the following statistics show: The number packed during the winter season of 1876–77 were 530,286; during 1877–78, 496,025; during 1878–79, 682,321; during 1879–80, 604,186 and during 1880–81, 540,554, of which 388,763 were packed at Indianapolis.

Average annual value of other principal crops of Indiana, *for seven years*, from 1872 to 1879 inclusive, in their order of importance:

PRODUCTS.	Bushels.	No. of Acres.	Yield per Acre.	Value.	Value per Acre.	Average Annual Value for 7 Years.
Corn, ...	98,897,188	3,152,729	31.4	$ .36	$11.12	$34,569,018
Wheat, ...	25,283,745	1,847,287	13.3	1.07	14.32	26,983,689
Hay, tons, ...	1,112,175	882,443	1.3	10.05	12.47	10,629,815
Oats, ...	13,955,478	552,353	25.5	.30	7.35	4,076,673
Potatoes.	3,860,250	52,231	70.1	.55	37.22	1,924,981
Tobacco, pounds, . . .	12,597,429	19,140	698.0	.06	40.33	781,523
Barley.	494,400	22,544	22.0	.88	19.00	427,953
Rye, ...	441,625	31,067	14.3	.67	9.57	294,106
Buckwheat, ...	155,074	9.865	16.0	.76	12.17	118.090

Number and value of farm animals in the State of Indiana, 1880, in their order of value:

	Number.	Val. per head.	Total value.
Horses	688,800	$54 60	$37,608,480
Oxen and other cattle	756,600	18 65	14,110,590
Milch cows	434,800	25 09	10,909,132
Hogs	2,186,000	4 70	10,274,200
Mules	58,800	60 72	3,570,336
Sheep	1,019,000	2 29	2,333,510

The average number and total annual value of farm animals for the *five years* ending January, 1880, was as follows:

	Number.	Value.
Horses	679,400	$36,791,590
Mules	60,320	3,712,585
Oxen and other cattle	766,040	14,031,349
Milch cows	437,460	11,328,758
Sheep	1,115,240	2,558,333
Hogs	2,289,020	12,346,644
Total	5,347,480	$80,769,259

POPULATION.

1880.	1870.	1860.	1850.	1840.	1830.	1820.
1,978,362	1,680,637	1,350,428	988,416	685,866	343,031	147,148

PERSONS TO SQUARE MILES.

1880.	1870.	1860.	1850.	1840.	1830.	1820.
58.51	49.71	39.94	29.24	20.29	10.11	4.35

MINES AND MINERALS.

Indiana is rich in coal of a bituminous character, including caking coal, non-caking coal, or Indiana block, and cannel coal. The coal measures form a part of the great field which extends into Illinois and Kentucky, and covers an area of about 6,500 square miles in the southwest part of the State, extending from Warren county on the north to the Ohio river on the south, and embracing twenty-two counties. The total depth of the measures varies from 600 to 800 feet, and the seams of coal range from one to eleven feet in thickness. In many cases, as in Fountain county, the coal is reached by adits driven in on the sides of the ridges or ravines. The deepest shaft in the State is less than 300 feet, and as a rule coal in workable seams is found at a depth of seventy-five feet.

There are eight distinct seams of coal found in the eastern division of the coal measures, and three of these have an average thickness of four feet. Block coal is used extensively in blast furnaces and smelting works. The amount mined in tons of 2,400 pounds was, in 1869, 437,840 tons; in 1876, 950,000 tons; in 1877 and 1880, 1,454,327 tons yearly; and a capital of $2,304,720 was invested, paying over $1,405,164 in wages to 4,496 employes—the value of the coal produced being $2,500,000. There were in the same year 70 stone quarries, employing capital to the amount of $613,560 and engaging 1,788 persons. The product was valued at $633,775

Hamatite iron and bog ores abound and yield a good percentage of metal to the ton. They are mostly used in the furnaces mixed with the specular ores of Missouri and the Lake Superior region, and the iron thus produced is of first quality.

The carboniferous limestone furnishes an inexhaustible supply of building stone of the best character. Some of the deposits are thirty to fifty feet in thickness; and foundation stones and columns of the largest size can be taken from these quarries.

The sandstone of the coal measures is also used for building purposes, and a deposit of lithographic stone has been discovered. In Lawrence and Martin counties there are valuable beds of kaolin or porcelain clay, equal in quality to that of China.

Stone for lime burning, hydraulic cement and white sand for plate glass manufacture are also abundant. And there are a number of salt and sulphur springs.

WEALTH, DEBT AND TAXATION.

The assessed valuation for purposes of taxation is $728,944,231. And it requires a tax of twelve cents on the hundred dollars to raise the amount needed to defray the expenses of the State government, which for the fiscal year ending Oct.

31, 1880, were $1,199,299. The receipts were $1,704,194. The State debt is $4,998,178. Of this $3,904,783 is due the common school fund, and bears six per cent. interest payable semi-annually. This leaves but $1,093,395 due to private parties.

There were in 1880, 15,919 commercial houses with capital and personal property and real estate, valued at $115,365,245; 3,191 manufacturing firms, $45,397,175; 4,492 mechanical industries, $3,255,245; and 147 incorporated manufactures, $16,072,434. The business capital of the State is invested as follows: 691 dry goods establishments, capital $11,010,950; 2,384 general stores, $20,103,325; 2,410 grocery and provision stores, $17,222,845; 1,291 drug stores, $7,247,350; 578 boot and shoe stores, $3,961,300; 354 lumber firms, $6,026,900; 467 hotels, $2,678,450; 649 millinery stores, $1,000,340.

Indiana has ninety-two National Banks with a capital of $13,828,674; and 138 joint stock, private and saving institutions, with a capital of $4,365,000 and deposits of $13,000,000. There are fifteen savings banks with a capital of $833,950 and deposits of $984,588. The Auditor of State exercises a general supervision over the insurance companies and banks (other than National) and annual reports are made to him.

Owing to the large quantities of distilled spirits produced in Indiana, the internal revenue collections are heavy. Of late years they have been as follows: 1875, $4,653,789; 1876, $5,579,126; 1877, $6,037,220; 1878, $5,710,837; 1879, $5,851,103. Total since 1862, $78,515,662.

COMPARATIVE STATISTICS.

Products *of the State of Indiana for the years designated, each ending April* 1, *as collected by the Township Assessors and compiled from the State Auditor's Reports and the Bureau of Statistics.**

Products.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	Census Crop of 1879.
Horses, number . . .	511,136	518,534	531,361	535,316	558,656	503,045	503,044	536,251	688,800
Mules, number . . .	61,397	60,439	61,189	57,231	58,470	57,815	57,970	53,117	58,800
Cattle, number . . .	1,138,179	1,055,943	1,058,821	1,067,306	1,017,388	1,065,143	1,065,143	1,254,655	1,191,400
Sheep, number	1,046,573	1,157,277	903,177	916,771	906,849	1,538,860	1,538,860	1,612,865	1,019,000
Hogs, number	2,408,657	2,183,069	2,455,534	2,575,186	2,626,541	2,003,943	4,368,965	4,104,378	2,186,000
Wheat, acres	2,010,849	1,829,595	1,492,386	1,708,870	2,220,636	2,422,480	3,109,845	3,210,547	1,847,287
Corn, acres	2,913,992	3,028,196	4,300,737	3,246,931	3,418,087	3,517,808	3,130,327	3,135,178	3,152,729
Oats, acres	583,425	592,516	556,380	626,699	674,231	883,492	686,901	580,279	552,353
Meadow, acres	1,063,048	1,029,654	1,184,010	1,266,781	1,116,428	1,011,835	795,438	988,560	. . . .
Wheat, bushels . . .	23,552,009	17,274,711	15,432,129	21,022,431	29,473,833	41,236,630	47,130,684	30,625,668	25,283,745
Corn, bushels	82,780,997	70,350,662	85,230,306	93,812,093	89,678,502	89,517,535	87,335,014	71,387,075	98,897,188
Rye, bushels	230,762	413,795	312,081	546,791	374,892	172,362	217,192	208,912	441,625
Oats, bushels	7,891,390	7,334,797	6,478,901	10,648,120	21,566,485	11,804,049	15,563,430	14,398,617	13,955,478
Potatoes, bushels . .	2,803,960	4,653,120	2,678,069	1,544,414	3,165,490	4,122,841	3,047,726	2,386,251	3,860,250
Barley, bushels . . .	261,233	149,935	142,760	134,245	235,663	343,751	687,911	526,364	474,400
Flaxseed, bushels . .	250,282	277,241	304,397	376,906	407,828	1,135,179	699,134	512,788	. . . .
Hay, tons	730,029	792,125	983,797	1,057,592	912,372	970,932	1,221,164	1,303,217	1,112,175
Wool, pounds	2,087,065	2,717,728	1,718,458	2,306,895	1,860,178	3,893,715	4,494,037	. . . .	. . . .
Tobacco, pounds . . .	6,765,499	6,769,590	12,378,731	12,773,636	7,408,104	6,790,413	6,752,020	6,565,782	12,597,429

* The figures for the years 1878, 1879 and 1880 are from the Report of the Bureau of Statistics. The figures of 1880 and 1881 are estimated by the Township Trustees and compiled by the Bureau of Statistics.

SHORT HORN BREEDERS, 1881.

The Short Horn Breeders' Association met in the rooms of the State Board of Agriculture, Tuesday, May 24, 10 A. M.

In the absence of the president, Hon. Thomas Nelson of Bloomingdale, Ind., the association was called to order by vice-president J. W. Robe. After some preliminary business, the secretary was instructed to keep as full a report of proceedings as possible, when upon motion of Mr. Mitchell, adjourned to 2 o'clock, P. M.

AFTERNOON SESSION.

The association met pursuant to adjournment, with Vice-President Robe in the chair.

Mr. W. W. Thrasher, of Groves, Ind., said, "I believe according to programme, I come first upon the list, but I do not propose to read my paper just yet. I propose we have an experience meeting. I have bred short horns for near sixty years until last year, and now I feel lost and am going into it again. The interest in my county is not as great as I could wish. I bought a Jersey about a year ago, and she is very good, but I am ashamed to show her to my friends when they come to see me. I want a young bull, and I want him white, or a real light colored roan. Now Mr. President I want to hear some expression from all my friends."

Mr. J. W. Marlatt, Wayne county. "I believe the interest in short horns is increasing in our county. Nearly all men who raise cattle for beef find that they are the favorites. Most all use short horn bulls. They do not want to pay long prices, but are willing to pay a remunerative price. As long as I raise cattle I want good ones. I have a white bull, and will say to brother Thrasher, I do not know what to do with him."

Dr. A. C. Stephenson, of Greencastle, Ind., being called upon to say what he had seen in his travels the last three years, said:

"I have seen but little in the time, only some three or four herds. The short horn breeders do not breed for bullocks, but for breeders. How the trade is, I am not prepared to say. Some years ago I saw shown at our State fair a breed of cattle that I thought were the worst lot of cattle I had ever seen; to-day they sell about with short horns, and their excellence all depends on one quality, namely butter, and butter only. Their tests have not been thorough, but are very satisfactory. If there is nothing about the test of butter by the color, I seriously question its richness. I saw a herd of one hundred head that made butter as white as could be, and asked why thus, and was told it was caused by cotton seed fed to the cows. I do not think that color of butter affects its richness. We claim for the short horns that they make the best butter and beef to ship to New York. Now add the milking qualities to the beef, do you not add value?

I saw it reported that the short horns were a beef breed only. That is not so. I do say they are good milkers. Just look at that calf which weighs 400 or 500 pounds and tell me they are not good milkers. They were always milkers up to the last day when the Collings' took their cattle to travel, and since that they were more used for show and not so often milked.

It is said short horns get so fat they are not milkers. I hold it as evidence that they are good milkers. Whenever you stop the flow of milk the secretion goes to fat. When you have a fat cow that calves, when suckling she looses fat and when dried fats very rapidly. If I were going to breed cattle to-day I would buy short-horns that milk and I would fat them too. You will find as good milkers in the common cow as in any breed, and I think that if the selection had been as judiciously made as in this breed they would be far superior to what they now are.

Mr. Thomas Wilhoit, Henry County. All I can say is I do not propose to quit breeding short horns, at least not until I quit farming. I have been breeding them for thirty years. I find them nice if well tended, and quite profitable. I do not intend to quit.

Mr. R. G. Haworth, Union County. The interest in our county is improving. I have three cows that are in bad condition since calving—others all doing well. Much inquiry after young bulls.

Mr. Elijah Clore, Montgomery County. I side with Dr. Stephenson. I find the calves do better when we milk about one-half. How can we winter cows best? I think cows fed on timothy hay and corn will fever the cow so she will not give good milk. I give chop feed and meal. I think one-half less amount of meal than corn does as much good as corn fed whole.

Here the President appointed Messrs. W. W. Thrasher, S. F. Lockridge and R. G. Haworth a committee to prepare programme for next annual meeting in 1882.

W. W. Thrasher then read the following essay:

The question submitted to me is: "What means have been used to bring short horns up to their present perfection?" It is not generally understood, nor does the history of the short horn date back more than about two hundred years. They were first found in northern England, at that time a distinct breed from all others, and were first brought to notice by Charles Collins & Bro., who took a fancy to the breed, and commenced handling them. They began with Hubback, a small yellow-red bull, and his mother, gave them good treatment and careful crossing, and, in their day, had brought them to a very high state of perfection. The chief success in developing the breed was good keeping and judicious crossing. That and that only will continue the perfection which we so much desire in the short horn. It is a question not yet fully settled, as to whether there has been any improvement in the last fifty or hundred years past in the breed. I am satisfied that there has been great improvement in that time, and think I am prepared to prove it. The short horn fifty years ago was larger than now with bone in proportion, and it took them six or seven years to ripen. When of that age they were large, fine, straight backed fellows. But now we can develop them at a much earlier age, small bone, fleshy animals, this I regard as being a valuable improvement. As this paper will be criticised, this perhaps will be sufficient to bring out debate.

I am satisfied, sir, that Short Horns can not be kept profitably unless we take particular pains. A young man will commence by getting too many, and half keeping them, until they are not fit to look at, and he, with his neighbors, become disgusted with them. Keep them in good fix and they attract buyers. I advise young breeders to begin with but few. If you expect to succeed, do not keep them fat and slick. Last year I bought an Ibex (or Jersey), I thought them no account. I bought the very best I could find, to try them, and, without going into any details, I will say I do not want any better milkers than the Short Horns. I am going to keep the Jersey and Short Horns together. I find the short horns beat in every case. The reason short horns are regarded as not being milkers, is because they know nothing about it. I am now convinced of the fact since I tried this Ibex (Jersey). If the Short Horn men can not hold their own with the Ibex men, let us go by the board.

Mr. Haworth. When the first importation of Short Horns was made, they were not the large, coarse cattle, but, as I remember, they were low heavy cattle. The question on a trip to Kentucky was, "Were High Dukes and Duchesses as good as Seventeens?" The butcher and shipper said they were not as good as the seventeens. When he shipped to New York, they were not asked if they were Dukes, etc.

Mr. S. F. Lockridge then read the following essay:

WHAT RELATION HAS THE COLOR OF THE HAIR TO THE QUALITY OF THE BEEF?

The resolution passed by the National Association of Short Horn Breeders at Lexington, Kentucky, to the effect, that color in short horns is simply a matter of taste, fancy and fashion, not affecting the quality of meat, or anything relating to the intrinsic value of the beast, etc., probably embodies the views of a majority of professional breeders. But there is no denying the fact that there is a color prejudice in this country in favor of red and against all other colors.

It behooves us to know whether or not this objection to certain colors is wisely founded. Because, as growers and improvers of beef animals, and as strivers after the highest attainments in the qualities most desirable in beef production we should learn to discard that which is inimical, and retain only that which is favorable to our purposes.

As public spirited citizens desiring the greatest good to the greatest number, as well as private individuals seeking personal emolument, we should be wary of prejudices of all kinds, and look upon all questions connected with our pursuit in the light of patient and laborious investigators of facts.

If the color of the hair is an indication of the quality of the flesh that lies under it, then, as practical men we ought to know that fact as soon as possible. If the beef that is produced under a red coat is of better quality and better suited to the purposes for which the animal is grown, then it is the part of wisdom to rear animals of that color to the exclusion of all others. And if it can be shown beyond cavil or doubt, that the beef from a white or roan animal is the best and most desirable, then, as wise men, we should confine ourselves to the production of animals of those colors. But if, upon the other hand, it can be successfully proven that the color of hair is *no* indication of quality, and is *not* a factor in the production of first-class beef, then is this prejudice in color unfounded, unreasonable, and deleterious to the meat interests of the producers as well as the consumers of beef.

It may be said that the color prejudice obtains only in the United States. It does not, and never has existed in England, the home of the best breeds of beef cattle, and probably to a very small extent in any of her colonies. The best authorities assert that white was the chief ingredient in the colors of the early short horns, and so far as the English people are concerned, they have made no effort to change this color, but have patriotically, and, as consistent with their conservative character maintained to this day, in equal degree, the matchless fame of the original "red, white and roan."

It is a matter of regret that so little is practically known on this subject of the relation of color and quality. Only of late years has the subject been discussed at all.

The records of the past on this question are silent. The breeders of a half and three-quarters of a century ago talked and wrote of the handling, feeding and milking qualities of their cattle, but the question of color does not seem to have entered into their considerations at all. The Collings, the Booths, Bates, Mason, and a host of others, founders of families of short horns famous to this day, are silent on the question of the relation of color to the quality of the beef.

Robert Bakewell, of Dishley, was perhaps the most distinguished and greatest improver of farm stock of his own or any age. Under his skilled and plastic hand the longhorns of England equaled, and at one time perhaps even surpassed, their famous rivals, the short horns. He was a patient and laborious investigator. In the seclusion of his laboratory he dissected and made anatomical studies of the carcasses of his cattle and sheep, comparing the dead with the living specimens, and applying the knowledge obtained to the improvement of his live stock. Unfortunately for the science of breeding, he left no record of the results of his studies and investigations. He kept the secret that had enabled him to accomplish so much for the food of his race locked in his own bosom, and carried it with him to the grave. We can only judge of his great skill and sagacity by the almost perfect bovine specimens he left behind him. In the course of a long life he had raised his long horns to a wonderful degree of perfection. In one quality only he made no change—the color. Skilled as he was to an eminent degree, he could easily have bred in one color, and bred out another if he had deemed such a course necessary to the greater improvement of his animals. But he did not. He changed the contour of his beasts, reduced the bone and offal, and developed the qualities necessary to constitute a perfect beef animal, but in color he left them as he had found them, blue roans, red roans, reds and red-and-whites.

Perhaps no color is more objectionable to the great majority of breeders of cattle than black, and in this country at least, the opinion pretty generally prevails that animals of that color are hard fleshed and wanting in quality, and yet the market reports of Smithfield and Birmingham will show that the highest priced beef in those markets is from the *black* Scotch Galloways. This race of cattle has always been noted for the prime quality of its beef. Nearly a hundred years ago Mr. George Culley, a distinguished authority upon agricultural matters, said of this breed of cattle:

"Their hides seem to be a medium between the long horns and the short horns; not so thick as the former, nor so thin as the latter; and, like the best feeding kind of long horns, they lay their fat upon the most valuable parts, and their beef is well marbled, or mixed with fat."

And again he says:

"They are readily sold, and at high prices, for few or no cattle sell so high in Smithfield market, owing to their laying their fat on the most valuable parts; and it is no unusual thing to see one of those little bullocks outsell a coarse Lincolnshire bullock, although the latter is heavier by several stones."

So much for the Galloways whose prevailing colors were pure black, or dark brindled brown.

As to the short horns the records of the past will show that the most noted animals of their race, celebrated for their good handling qualities, and the evenness with which they laid in their flesh, were the reverse of the last in color— whites and roans. It needs but a reference to the herd books to prove this. The *National Live Stock Journal* for July, 1880, shows that out of 1,700 animals whose colors are given in the first volume of the English Herd Book, 939 were roan; 369 were red and white; 207 were white, and 185 were red. Thus we see that of the animals whose colors are given in the first volume, more than *two-thirds* were roans and whites. And so, an examination of the remaining volumes would show that a large majority were light colored animals.

Hubback (319), the Nestor of Short Horns, whose handling was said to have been superior to any bull in his day, and whose coat was like a mole-skin, was yellow-red and white.

Favorite (252), who appears in more pedigrees, perhaps, than any other Short Horn that ever lived, was a light roan.

Comet (155), the thousand guinea bull in 1810, was a light roan with red neck.

Belvedere (1706), Duke of Northumberland (1940), and Commander-in-chief (21,451), perhaps the three most noted bulls of the last half century, were roans, as were Townley's famous bull Frederick (11,489), and his Master Butterfly (13,311), that went to Australia at 1,200 guineas.

Valasco (15,443), Leonard (4,210), 7th Duke of York (17,754), and the celebrated Princess bulls, Earl of Dublin (10,178), General Sale (8,099) and South Durham (5,281), were white.

Among the celebrated light colored females was Old Favorite, Young Strawberry, Colling's Moss Rose, Young Duchess, the first of the tribe, a yellow-red flecked, Townley's Barmton Rose, the Matchem cow, who was the progenitor of the Oxfords, and Mr. Booth's famous Bracelet, Lady Fragrant, Bride of the Vale, Rose of Promise, Soldier's Bride, with a host of others, and last, though not least. Lady Pigot's world renowned Rosedale.

These are but few specimens, selected almost at random, from a long list of illustrious animals that have made the Short Horn race of cattle famous for all time to come. Thus we have seen animals celebrated for their beef producing qualities, ranging in color from pure white to pure black. Doubtless, if the truth was known, many illustrations could be given of hard-fleshed and unprofitable animals with the same diversity of color. If so, it is but accumulative evidence in support of the fact that the color of the hair, at least, is not an indication of the quality of the beef.

Dr. Stephenson. Much depends on selection. You may take the red-white and pied, and you may have good animals. I think that the early breeders were more judicious in their selection of cattle, but now everything is kept for breeders. There was not much sale for bulls, and of course the inferior ones were cut. After Mr. Collins showed those fat cattle, it created a market for bulls, and everything was kept for breeders, to the injury of the breed. We do not make our selections judiciously. There are some things about the keeping of cattle we do not understand. It requires more than good care and feed. The Texas steers are all one and the same; they are a distinct breed of cattle, and in Cherokee Nation there is a difference. The climate and pasturage has something to do with it. Will our short horns here differ from the cattle in England? We may feed the same. I believe in time there will be a difference. I think there is more than selection. I find that the climate and surroundings produce a difference. Probably the color of cattle has nothing to do with the quality of beef. However, I am not prepared to say. Would it not therefore be probable that the color of skin and the color of flesh immediately next to it be in some way affected. I asked a butcher, "have you ever discovered a difference in color of flesh between white and red animals?" "Yes; the white, the whitest." There is an idea in Europe that dark red beef is not as good as fair white beef. Therefore, there may possibly be some connection between the color of hair skin and beef.

Hon. S. F. Lockridge. We see by the English market reports that those black animals bring the highest price in the market. If there is anything in this we want to know it. I wish to hear from Mr. Earl, who was in England last fall.

Mr. Earl. I made a trip to England to purchase Hereford cattle, red cattle with white faces, white on the back and belly, universally. I traveled through Scotland. There I saw dun bluckyneat cattle. They were not so common as the Angus and Galloways. They are black, without horns. They are very much alike, and we found in Germany and France they stood high, both as grazers and feeders. At Paris, the World's fair, the black polled Angus cattle were awarded the prize as the best beef cattle. The Scotch are thrifty people, they make choice selections, and keep their stock well, and whenever kept were profitable. This seems to settle the question of color, as they are all black. In size, about the same as short horns. I was at a sale in Aberdeen, Scotland, where the Angus sold very high. In regard to color of the hair, it may not reach the skin and flesh. I visited a Jersey sale, and I noticed the experts at all fairs scaled them, and I never knew an animal to take a prize unless it had yellow skin. We see in milk stock various colors. It struck me that it may not affect the color of the meat.

In Jersey they prohibit the importation of any other cattle. There has been Jerseys sold in New York as high as $4,500. Before I went to Jersey I was somewhat prejudiced, but to see to what perfection those animals have been bred is astonishing. The farms are only from five to thirty acres. We here found buyers from all parts of the world. We passed the Alderneys and Gurnseys, they are red and white as they have been crossed. There is just as much commercial difference in color as can be, fawn, black, silver, gray, etc. But they say we have had as fine cattle of mixed colors as any. I really think there is no advantage in color. We have a two-year-old from which we churn eleven pounds of butter per week. It is generally accepted that the yellow color is the best. I found the Jersey yellow color there the common one, and the two-year-olds makes the yellowest of all.

The Galloways and Angus, imported to the United States, have found many friends in this country, are good feeders, and give good satisfaction. I want to breed Herefords and Short Horns, as there is a demand for that class of animals. We are breeding about 400 head this season, every one a red. The color of the Colorado cattle is bad, being light duns, brindles, etc. They will find it to their interest if they can change them to imitate the Short Horns and Herefords to ship to this market. We took pains to get all reds, so as to be more sure of getting red bulls. There seems to be no end to this kind of cattle. They use one bull to twenty-five cows. Those men say we breed to Herefords and our steers are better in our climate and our treatment. Their head and neck are a little heavier than Short Horns, and are liked better. My notion in regard to color is that it is entirely a fancy in favor of red, but think it gives them a commercial value. I have a herd of Short Horns bred for twelve years. I started with four heifers and one bull. One heifer, a Booth, I paid $1,310, spotted red and white. She had eight heifer calves, and from her and her produce I now have nineteen head.

Mr. Thrasher. What has color to do with beef? There is some things we all know and some things we do not know. We sometimes get good tender beef and sometimes not. It does not matter to me who opposes, I will give the reason, and I do not fear contradiction. Why do good handlers make tender beef, and has color anything to do with handling? Go to experts at New York, Albany, etc., and they invariably put their hands on the animal before they buy them, they chalk the good ones and they make good beef. And now in what color does the handling predominate? I say without fear of contradiction, that the majority are roans and white. I know that some reds are good, but not so many as in the white and roans. You may hang up some beef and it looks red, and fries like saddle skirts, and you can just about as well eat it as a saddle skirt. I do think that this question is, according to my experience, in favor of roans and whites, and a good quality of beef comes from good handlers.

Mr. Lockridge. I do not know as Bro. Thrasher and myself are so far apart at last. We both claim a good handler to make good beef, but I do say that color of hair is not an indication of beef alone. I claim silky hair makes good handlers and good beef; while coarse hair are bad handlers and poor beef. I once bough a black heifer with fine silky hair and she made a good quality of beef. I believe the texture, and not color has something to do perhaps in the short horns, it predominates in roans and whites.

Mr. Wilhoit. What makes a good handler? I can go to a meat shop and pick it out every time, the beef in color is light red—deep red is tough, etc., when cooked it is tougher. "*Question.*" Do you find any difference in color? Yes. In short horns the roans and whites are the best.

Mr. Cox. In picking a breeder, we should pick a good handler regardless of color. The Poles are black and are good handlers. I think if the hair is fine it is a good handler, while the rough is the reverse.

Mr. Mitchell offered the following resolution:

Resolved, That the name of this Association be changed so as to read, "Cattle Breeders" Association, instead of Short Horn Breeders.

Mr. Lockridge. I object for the reason that it would require an entire change of the Constitution.

Mr. Thrasher. I propose to strike out the word short horn wherever it occurs. I want those "Ibex" (Jerseys) men to come here and present their claims.

Mr. Lockridge. I am opposed to this resolution, not because I am not liberal in spirit or do not want all classes to succeed, I can not see any reason why the breeders of Short Horns, Herefords, Jerseys, etc., shall come to a wrangle. I think that this Association's peace of mind will be entirely destroyed and work a mischief instead of good.

Mr. S. R. Quick. In adopting this resolution we entirely do away with the Short Horn Association. This meeting is for the short horn breeders, and I can not see where we would have any advantage.

Mr. W. W. Thrasher. If we bring Jersey cattle men here we can convert them to the Short Horns.

A vote being called for the resolution was rejected. Adjourned to meet at 8:30 o'clock.

Association met at 8:30 o'clock, when the following essay was read by J. W. Robe of Greencastle, Indiana:

HAS THERE BEEN ANY IMPROVEMENT IN THE SHORT HORNS WITHIN THE LAST TWENTY-FIVE YEARS.

The importation of short horns into this country has wrought a wonderful improvement in our agricultural condition, and has not only done wonders in improving the ranks and file of our own cattle, but has brought a handsome profit into the "strong box" of the farmer in general.

"Man's wonderful supremacy" over the animal creation is no where shown to greater extent than in the influence he has exerted in directing the vital processes which have formed and developed our cylindrical short horn of the present day; and within certain limits he has demonstrated his power to make nature obey and do his bidding.

The mass of old short horns were coarse, many of them loosely made up, too prominent in bone, hard handlers, depressed crops, rough shouldered, flat ribbed, lacking flesh in the more valuable parts of the carcass, and having too much offal for their net weight. In short, what comprise their chief excellence, was not so well and finely developed as now.

In contrast, we now have the even fleshed animal, compact in form, small head and delicate muzzle, short legged and fine in the bone, well sprung ribs and full in the crops, wide spread hips and long and deep quarters, excellent top and bottom lines, broad and level lone and elastic touch, great weight of carcass in proportion to frame, and in short, exhibiting a full and graceful outline generally.

To arrive at this wonderful difference in form has taken much time and skill, for there can be no short cuts taken to arrive at great results. Things of a permanent nature and of great utility are of necessity slow of growth. Trees must have time to grow, and fruit time to ripen; so this wonderful race of cattle, the greatest the world has ever known, was not built up and developed to its present perfection in a day, but it has been the works of a century or more.

There were in the times of the Collings, the Booths and Bates, some animals of *rare* merit (for those times), and possessing many superior qualities, but we have learned to look upon them as great animals because history and tradition speak so loud and freely in their favor. But this thing of looking back through the opaque glass of dim history and saying we have not produced any animals equal to Favorite, Comet, Belvidere, Duke of Northumberland, Crown Prince, Buckingham, Commander-in-Chief, etc., since their time, is like believing a far-off hearsay story, rather than believe what we see with our own eyes and what is at our own doors. I grant that they were superior animals of their times; but it is hardly possible that animals near the origin of a great breed of cattle should be better than now, despite the vigilance and persistent efforts of a host of intelligent breeders to improve for at least one hundred years.

Such animals as these did not abound in every herd; nor do I believe their excellence was so conspicuous in the annals of their own day as it now seems to us. I have no doubt we have very many equally meritorious animals produced now-a-days during every successive year, saying nothing about many superior ones.

This great race of cattle was not produced by chance or haphazard breeding to its now full fleshed, ripe growth and early maturity, for there is a wide difference between the modern short horns and the older ones, as shown by comparing the plates of their respective times.

Short horns have the susceptibility of improving every other breed with which they are crossed. Witness the short horn cross on our common cows, and the Jerseys. A very prominent instance of this has come to light of his great powers in this direction in the late fat stock shows, both in England and America. It was the short horn blood in Mr. Miller's so-called Hereford steer that no doubt made him the second best steer in the Chicago fat stock show; and the short horn blood in the Black Polled steers, exhibited at Hull, Birmingham and London, that made them the champion animals of those *greatest* of *fat stock shows* of the *world*. All were in effect grade short horns. If so good then to improve other breeds of cattle this shows that improvement in their veins and one of their own great peculiarities to improve above their own originals, for this is one of the chief characteristics of their nature.

Our own experience and observation, as well as history, shows us plainly that the mass of Short Horns have steadily improved since their early breeding, to the present, and are now very materially better animals than ever before. If then, there has been improvement upon our early Short Horns, through careful and intelligent breeding down to the present, (and this I think is patent to every one), then it necessarily follows that the last twenty-five years has had its share of this improvement.

Our breeders have, within the last twenty-five years, acquired much more skill in the propagation of their herds, and as a consequence improved their stock in a corresponding degree. There are now better judges of a good Short Horn and of a good beef animal; nor was the standard of excellence then so high as it is now. This standard of excellence has improved steadily from the first, so that the average quality of the well bred Short Horns is higher to-day than ever before.

There were, as you all know, many animals winning first prizes at our fairs twenty-five years ago, which no owner of such as they, would now venture to lead into a show ring. Yet, descendants of these animals, at the present day take the highest honors in our show rings; but they do so with fresher and more costly strains of blood in their veins, and by bringing to bear the experience and skill acquired by many years of careful breeding.

The taste of our beef consumers at home have developed into greater sensibility in the last decade, and this has been done by the good beef qualities of our Short Horns, which commands the top price.

That there has been great improvement in our American Short Horns, England bears abundant testimony. Many pedagreed animals have been taken back to England during the last few years, at enormous prices to improve their herds.

Again, look at the wonderfully increasing demand of our export trade for our short horn steers, which has increased about sixty per cent. during the past year. Only a few years ago American beef was unknown in the markets of the Old World. Now our cattle products are exported to the enormous sum of $60,000,000 for this year. This cattle traffic is due mainly to the advancing good qualities and diffusion of short horn blood. Only a few years ago we had few if any beef cattle good enough for this gigantic export trade. The "Mark Lane Express," says, "Americans have done more to improve their cattle in the last five years than English farmers have done for theirs in the last twenty years. If any one doubts this let him go and look at a lot of imported American beasts, (short horns of course as none others are exported for beef,) and then go to the fairs and markets and draw his own conclusion."

Englishmen say it is wonderful how we Americans having seized upon an idea carry it into effect and especially is this so in the improvement of short horns.

Attention is now paid more to the fine form, the quality of the flesh and texture of the body, than in former times; the butchers want the short-legged and pony made cattle, and we should aim to raise the animals that will produce the greatest amount of profit in proportion to the food consumed. Much of this must depend upon the art of breeding, and the art of breeding depends greatly upon judicious crossing. To carry out the system of crossing them judiciously certain general rules should be observed. The offspring in almost every instance resembles the male parent, and therefore the more desirable qualities there are united in the male the greater transmissive powers he will have and the nearer perfection will be the offspring.

With the great amount of intelligence that has been brought to bear in the breeding of short horns in selecting and watching their physiological tendencies, we certainly have greatly improved our short horns of late years and have now an animal that matures earlier, has more rotundity of frame, lays on a greater amount of flesh on the more valuable parts of the carcass and of a better quality, and do it with less food than at any time previous in their history.

There are some breeders however, in trying to please and obey the mandate of fashion in stooping to line, breeding and trying to follow the false notions of color, who have not improved upon the animals that have been under their immediate charge, but this is the exception and not the rule.

There is a great future before us, and let each one strive to inaugurate a revival of interests in this breed, which has for a century led all others in public estimation and utility. Let each one strive to couple the very best and nearest perfect animals he can find and thus advance to still greater heights of perfection, and by the ushering in of the next century we shall see still greater developments of beauty and excellence in short horns than we have in the past.

GREENCASTLE, May 24th, 1881.

Mr. Clore. We have a greater number of Short Horns than we used to have is why we can not see so much improvement. Many breeders breed animals of no merit but pedigree, and not to the merit of their cattle, as they do not understand the science of breeding.

Mr. Thrasher. I think the paper good in the main, the earlier maturity we can produce in any animal the better it is to the animal, because we can make 100 pounds of flesh better than 200 pounds, that is, the first 100 pounds is made for one-half less than the second 100 pounds. The custom of breeding has changed so that the size of bone has been reduced, and they mature much sooner, then we ought to have that kind of animals that mature earlier as they make the best beef. I remember of seeing 1,000 of them twenty-five or thirty years ago that did not mature until six or seven years old, but we can not afford this, we must mature early or there is no difference. Many farmers do not know they have some No. 1 cattle that are good handlers, and are worth more than others per pound. There has been this improvement made in twenty-five years, as they mature early, the beef is more tender and more palatable. After you breed to perfection you can not go beyond, but if you have a good animal, and can keep it you are all right.

Mr. Haworth. We get to certain perfection in stock, and their tendency is to degenerate. In pigs I made a specialty, and sometimes used my best boars and sows, and do what I would I could not keep them up to their sire and dam, but in a few generations they would come up to the standard.

Mr. Clore. There is some animals that do not mate well and breed back, while some inferior animals breed well together.

Mr. Cooper, Cadiz, Indiana. I do not know as I have anything to say upon the subject, as far as my experience goes there has been a great improvement in short horns. Mr. Wilhoit, the nearest breeder to me, has made quite an improvement in his short horns, and I think I have made some improvements myself.

Mr. J. W. Marlatt, Milton, Indiana. I wish to say I have been in the short horn business forty years. I have some recollections of improvement being made. I think the old ones not as good feeders as at present. Also in maturity, they cut better high priced beef. I want to turn my cattle off at three and a half years old.

Mr. Lockridge. I am sorry I did not hear the able article read, this question may admit of more than one construction. If we are to ask if short horns improved in twenty-five years, I say yes, but if of the whole country, Europe and the United States, I would say no, for we had only a few twenty-five years ago. Forty years ago Richard Booth bred as good short horns as ever stood upon four legs. We do not pay so much attention to selection as they did one hundred years ago, they bred for milk and beef, and if not up to the standard were sold to the butcher. Now we save everything and use them for breeders. Who in this age ever heard of a "Duke" or "Duchess" being turned off. I believe if we weed out as they did we would have better cattle. We have been improving since 1852, and now we can see what has been done.

Mr. Marlatt. We had in our county (Wayne) the first short horns about fifty years ago, and have made much improvements since then.

Mr. Marlatt then read the following essay:

WHAT VARIETIES OF GRASSES PRODUCES THE MOST MILK.

In submitting a few thoughts on the varieties of food that produces most milk, I shall confine myself to food within the reach of most farmers for winter. I feed clover hay with ground corn and oats in equal quantities, with as much wheat bran as corn and oats, with all the blue grass and timothy pasture we can conveniently furnish them.

Second, clover hay with coarse shorts, commonly called shipstuff, mixed with a good quality of sheaf oats, cut nearly to the bands with blue grass and timothy pasture as above.

If the pasture can not be had I will expect good results without it.

For summer feed I will suggest blue grass, timothy, red and white clover, preferring red clover for quantity of milk to white, letting the cows have access to the different varieties of grasses at the same time; would also recommend a small quantity of ground corn and bran or some shipstuff. If we do not have that, a little corn in the ear, in the early part of the summer at least.

Mr. Clore. I side with Mr. Marlatt, that this food is better than if fed on hay alone.

Dr. Stevenson. Do you think it advisable to feed bran, etc., when on grass?

Mr. Marlatt. Yes, I believe it is.

Dr. Stevenson. Will it pay for the extra feed?

Mr. Marlatt. Yes, I think it will.

Mr. Robe. Will your cows not get too fat this way?

Mr. Marlatt. No, I think not. Once in a while they may, but as a rule they will not. I always feed a few this way: to the cows raising calves in winter I feed corn, and hay, straw, etc., to the ones we milk, I feed twice a day. I tried a good young cow in this way, and found the increase of one and one-half gallons.

Mr. Robe. Do you regard blue grass better than clover?

Mr. Marlatt. Yes, I do. Red clover milk is not so good; white clover makes better beef, but the milk from red clover is ordorous. I prefer a mixture of grasses for pasture.

Col. Fielding Beeler, Indianapolis, Ind. It is a mistake to suppose that an animal that gives milk and gets fat, is not a good milker. I never found better feed than fodder. Hay makes them dry up, and fodder makes milk. I would like to know what is good for milk fever. I lose some cows every year from that cause.

Mr. Thrasher. I have the best work upon this disease, and I find it of no account. My own experience is that it invariably attacks the best milkers. We should use some precaution in regard to this. They should calve in cool weather and keep out of the hot sun. I have my best milkers calve in cold weather—February or March. The first symptoms of fever is lassitude. I have had some experience with this disease. One cow was attacked when there was a deep snow on the ground and rainy, and in the evening the water was half way up her sides. I got her up, took her home and she got well. I had another attacked that calved in June, and concluded to try cold water on her loins. I put salt in the water, and spent one day and until nine o'clock at night, and then expected her to be dead in the morning. Instead of which she was well.

Mr. Cox. I had a grade cow with milk fever that got down at once right in the sun. I carried cold water and put on her. We used one bucket full about every ten minutes all day and night, and in the morning she seemed like she wanted to eat. I gave her corn, and at noon she got up and went into the shade. In two days more one-half of her udder mortified and dropped out, but she lived, and I believe the cold water saved her.

Mr. Thrasher. The proper way to apply the water is to hold it up high, then pour it gently along the back and loins and especially just back of the horns.

The committee on programme reported as follows:

Programme of the Indiana Short Horn Breeders' Association, May 30 and 31, 1882:

Has the Mania for Red Cattle been for Good or Evil to the Short Horn Breeders?—*S. R. Quick, of Columbus.*

What Effect does High Prices Paid for Cattle have upon the Short Horn Interest Generally?—*Hon. Claude Mathews, Clinton.*

What is the Most Profitable Age to Sell Steers?—*J. W. Robe, Greencastle.*

What is the Cause of Short Horn Bulls Becoming Worthless or nearly so at Three or Four Years old?—*E. S. Frazee, Orange.*

How can we get Men with Common Cows to Breed to none but Short Horn Bulls?—*W. D. Cooper, Cadiz.*

What is the best Winter Feed for Short Horns?—*George McCaslin, Franklin.*

In what Condition should we Keep our Short Horn Cows to be in the Best Breeding Condition.—*Elijah Clore, Alamo.*

What are the Best Grasses in Indiana for Producing Beef?—*Hon. Robert Mitchel, Princeton.*

Can the Beef and Milking Qualities be Successfully Combined in the same Animal?—*Dr. A. C. Stevenson, Greencastle.*

Hon. S. F. Lockridge. I wish an expression as to the awarding of premiums at fairs, as I think a great deal of harm is often done by not allowing judges to consult before making awards. I think they ought to ballot first and then consult, as the stronger will usurp the weaker.

Mr. Cooper. Mr. Lockridge speaks my mind exactly. Every man has his prejudices in favor of a particular animal, right or wrong.

Dr. Stevenson. I often thought of this subject. I like to see the thing go one step further. I think no one ought to know how the judges vote.

Mr. Thrasher. The awards made at our fairs are of greater importance than we at first suppose. The point is this: We must desire to arrive at a correct conclusion, for the exhibitor is not alone interested in this, but the whole country, as it is a lesson for many who want to go into the breeding of short horns. I favor a vote first, then consult. I am opposed to the ballot system, as you are not apt to arrive at correct conclusions.

Mr. Lancaster. I have seen some very unjust awards made. The ballot before consulting seems to me to be very proper.

Mr. Mitchell. Then read from the Indiana Agricultural Report, for the year 1880, page 247, which refers to the difficulty of securing proper committees on awards.

Mr. Ragan. I have had experience in the difficulty of selecting competent committeemen. It is a very great task.

SECRETARY'S REPORT.

To the honorable President and gentlemen of the Association:

I have expended two dollars and sixty-five cents ($2.65) for printing, postage, etc., for which I ask an allowance.

May 25th, 1881. Respectfully submitted,

T. W. W. SUNMAN, Secretary.

TREASURER'S REPORT.

INDIANAPOLIS, IND., May 25th, 1881.

Mr. President—I beg leave to make the following report:

Last year's report shows that there were in my hands	$42 30
Received at this meeting for new members	3 00
Total	$45 30
Paid to T. W. W. Sunman, Secretary, for printing, etc.	2 65
Leaving in my hands	$42 65

All of which is respectfully submitted.

W. W. THRASHER, Secretary.

The reports of secretary and treasurer were accepted.

The election of officers for the ensuing year resulted as follows:

President—Hon. Thomas Nelson, Bloomingdale, Parke county.
Vice-President—J. W. Robe, Greencastle, Putnam county.
Treasurer—W. W. Thrasher, Groves, Rush county.
Secretary—T. W. W. Sunman, Spades, Ripley county.

A vote of thanks was tendered Alex. Heron, Secretary State Board of Agriculture for courtesies extended.

Association adjourned.

J. W. ROBE, Vice-President.

T. W. W. SUNMAN, Secretary.

MEMBERS INDIANA SHORT HORN BREEDERS' ASSOCIATION, 1882.

Name.	Postoffice.	County.
W. W. THRASHER	Groves	Rush.
THOMAS NELSON	Bloomingdale	Parke.
E. S. FRAZEE	Orange	Rush.
L. HANNAH	Waveland	Montgomery.
JOHN HULL	Princeton	Gibson.
ROBERT MITCHELL	Princeton	Gibson.
ALBERT MARLATT	Milton	Wayne.

J. W. Marlatt	Milton	Wayne.
M. Gallagher	Muncie	Delaware.
L. H. Aikman	Dana	Vermillion.
Claude Mathews	Clinton	Vermillion.
R. G. Haworth	Liberty	Union.
S. Wooters	Billingsville	Union.
Thomas Wilhoit	Middletown	Henry.
J. A. Johnston	Green Hill	Warren.
R. O'Hait	Greencastle	Putnam.
Dr. A. C. Stevenson	Indianapolis	Marion.
S. F. Lockridge	Greencastle	Putnam.
J. W. Robe	Greencastle	Putnam.
A. M. Black	Greencastle	Putnam.
Fielding Beeler	Indianapolis	Marion.
George W. King	Edinburg	Johnson.
William Crim	Anderson	Madison.
J. M. Woodruff	Nineveh	Johnson.
J. P. Forsythe	Franklin	Johnson.
S. W. Dungan	Franklin	Johnson.
Caslin Sons	Franklin	Johnson.
Elija Clore	Alamo	Montgomery.
L. McDaniels	Rushville	Rush.
H. C. Meredith	Cambridge City	Wayne.
C. B. Jackson	Centerville	Wayne.
Samuel Dinsmore	Bloomington	Monroe.
Charles S. Miller	Anderson	Madison.
S. R. Quick	Columbus	Bartholomew
J. J. Farquhar	Trenton	Randolph.
Daniel Cox	Cartersburg	Hendricks.
T. W. W. Sunman	Spades	Ripley.
W. D. Cooper	Cadiz	Hendricks.
G. W. Lancaster	Indianapolis	Marion.
Adams Earl	Lafayette	Tippecanoe.
G. W. Thomas	Homer	Rush.
W. L. Walker	Carthage	Rush.
A. S. Bryan	Greencastle	Putnam.
R. A. Hudleston	Dunricth	Henry.
Louis Gwinn	Aroma	Hamilton.
W. H. Chapman	Attica	Fountain.
J. A. Thompson	Edinburg	Johnson.
E. C. Thompson	Edinburg	Johnson.
D. T. Thornton	144 College avenue, Indianapolis	Marion.
M. H. Anderson	Rockville	Parke.

STATE DAIRYMEN'S ASSOCIATION.

AGRICULTURAL ROOMS,
FRIDAY, January 6, 1882.

The Association met, President Sylvester Johnson in the chair.

PRESIDENT'S ANNUAL ADDRESS.

However little the president of this association may know of the means best calculated to secure the objects sought by its organization, usage compels him, at its annual meetings, to tell that little. It is not expected, at least in this instance, that he will be able to add to the stock of knowledge possessed by those who have given much more of their time and attention to the dairy interest than he has, but simply to introduce some topics and open the way for their discussion.

The first question presented to my mind is, why is there so general a want of interest in an industry which is so essential to the health and wealth of the people, as well as to the material interests of the State.

With a view to making some comparisons of the dairy interest of this State with other industries, I have made some calculations based upon figures obtained from the Statistical Report of 1880. This report gives 394,832 cows used for dairy and breeding purposes. These valued at $20 each gives the sum of $7,896,640, invested in cows of this class. We also find the amount of taxable personal property, for the year 1880 is $192,382,202. So that the value of both breeding and dairy cows is only 4-100 of the value of the personal property, or, in other words there were only $4 invested in cows to $96 invested in other personal property. Considering the great importance of having a plentiful supply of good wholesome milk and butter for the use of the inhabitants of our State, the amount thus invested in cows seems to be very trifling. On the same basis we find $13 out of every hundred invested in horses, or over three times the amount invested in cows. Statistics of the same year show 122,157,613 gallons of milk obtained, or 62 gallons to each person. Probably three-fourths, or 45 gallons of this is used for butter making, and one-half of the balance, or 8½ gallons, for culinary purposes, leaving only 8½ to be used as food by each person in one year. This reduced, gives the allowance to each person of our State of 272 gills per year, or 74-1,000 of a gill each day, or about 25-1000 of a gill for each meal. It is true many persons do not use milk as food, so that those who do use it, get somewhat more than the above figures indicate, yet nothing like the amount necessary.

Again, we find that the year ending April 1st, 1880, produced 28,617,086 pounds of butter in Indiana. This gives us about fifteen pounds for each inhabitant for the year, or less than two-thirds of an ounce per day, and less than one-quarter of an ounce for each meal. This scanty allowance no doubt suggests the thought in many a household, that moved an old Quaker friend of mine to say to his boarder, "George, I want thee to get the worth of thy money, but I would like to have thee spread the butter on thy bread more lightly." When we consider the favorable conditions that exist in our State for engaging in this industry, and how lucrative it may be made if intelligently followed, is it not strange that we find ourselves so indifferent on this subject? Instead of a very scant supply for home consumption, we ought to export large quantities of dairy products. Instead of this I am told we actually send large sums of money to other localities where the conditions for producing these articles of diet are, at most, not more favorable than in our State. My opinion is that we have run to hog too much in Indiana, greatly to our disadvantage both as to health and wealth. Referring again to statistics we find that the value of hogs in this State for the same year is $29,054,033, while that of cows is $13,819,120, or less than one-half of that of hogs. From careful observation I conclude that $100 carefully invested in cows will, at the end of four years, return to the owner more money than if invested in hogs.

When we consider the importance of milk as a diet, especially for children, and view the facts presented by the foregoing figures, we at once recognize the want of greater interest in this industry by the people generally. Then the question presents itself, "How can we best interest the masses in this industry?" One of the means we have already adopted in the organization of this association. But this being a State institution, and only meeting once a year, and the attendance being small, we do not reach the masses to the extent desired. Much has been done in the last few years in the right direction by the introduction of improved dairy stock, notably the Jerseys. Much more remains to be done.

The formation of associations are necessarily important to the success of the object sought. Ours is in its infancy and has not as yet accomplished much, but in my opinion is just now about to enter upon a career of usefulnes not heretofore realized. Ours is an unselfish work. We do not labor for ourselves but for the people of our State. It is true we enjoy our fine healthy cows, our good pure milk and butter; and while our home dairies do something towards replenishing our somewhat scanty purses, they also add much to the health and comfort of our families. And yet we are so unselfish as to desire our neighbors and all of the people of our State to enjoy these blessings with us. We desire to add to their happiness and thereby increase our own. It is true we like good prices for our Jersey calves, but then we want our neighbors to raise calves that they can get good prices for, too. But, seriously, we ought if possible to secure a better attendance and greater interest in our State organization, and then its influence may be extended throughout the State through local organizations. Our association already commands the respect of the people, and especially the Legislature; for you will remember at our last meeting we passed resolutions asking the Legislature to pass an act punishing those who adulterate food and drink. The Legislature at once adopted the suggestion and gave us a fair law on this subject, which no doubt has saved much physical distress and many lives. An effort is being made by dairymen (not members of this association I am glad to say,) to break down or neutralize the effects of this law. I hope this meeting will take such action as will tend to strengthen the friends of the law in the efforts to sustain it, and to thwart the aims of those attempting its overthrow. Since writing the foregoing, Hon. J. B. Conner, State Statistician, has placed in my hands the statistics of 1881, from which I am pleased to see a much better showing for the dairy industry than is exhibited in another portion of this paper.

From these we learn that the excess of cattle in 1881 over 1880 is 204,020, and that the decrease in the number of hogs for the same time is 223,721. So that it appears we are not "running to hog" at all, but rather in an opposite direction.

In concluding this hastily written and very imperfect paper, I again thank you for your partiality in making me your presiding officer one year ago, and I now take great pleasure in returning to you the trust then bestowed.

THE DAIRY IN INDIANA.

BY P. D. HAMMOND.

Gentlemen of the Dairymen's Association of Indiana:

Granting what we all know to be true, viz: That in all the conditions, except climate, this State is equal to any other for the business of dairying. Let us come straight to the discussion of practical questions. As to the single exception noted, it may be said of climate that, while ours is not quite as favorable as cooler latitudes, it merely necessitates some extra care and painstaking to overcome all difficulty in that regard. The dairy business, like all other industries, is undergoing that transition of methods, which involves the changes from manual to mechanical power, from mixed to divided labor, from individual skill to scientific system. Under the original system of isolated individual dairies, the highest perfection attained in America is doubtless to be found in New York. Nothing approaching it was ever seen in Indiana. Here, we will say in Otsego county, you visit a dairy farm in the fall. In a cool, dry and *clean* cellar, is the product of the whole summer's work, 2,000 or 3,000 pounds of butter packed in sweet, wooden firkins. Is it good butter? The fact that it was so made and so laid down that the whole product of four to six months is alike sweet and redolent of clover and green pastures answers that question. I will not say that a lot of such butter of such an age can not be produced and put upon the market in Indiana, but I do not believe it ever has been done. Yet even this splendid success of hard toil and the skill born of experience is soon to give place to the factory and written science. It is admitted that the dairy interest of Indiana is of the first importance and rapidly growing. Wherein lie the principal defects of the business, and what can be done for its improvement? These are the practical questions that I will briefly discuss. The first point relates to the cows and their management. Among New York dairymen a good cow gives fourteen to sixteen quarts of milk per day and produces eight or nine pounds of butter per week. In Texas a man may own one thousand cows, yet he can not obtain milk for his coffee. Whence the difference? All in methods and objects. The New Yorker wants milk, the Texan wants beef. The dairy demands milk. So we must begin with the cow which has been properly described as a milk machine converting grosser material to milk with more or less effect as she is well or ill managed. There is undoubtedly in this State now a small element of intelligent dairymen who handle cows with skill. But in general such is not the case. The aggregate waste and loss on cows I suppose amounts to almost one-half of their possible profit. The first common mistake is in the period that cows run about eating and go dry. With average farmers, this is about half the time. With milk and dairy interests in view a cow should never rest from milking more than six weeks in a year, and with the right treatment she should not run more than four weeks, nor less.

Why do cows dry up so suddenly? The cause is partly hereditary in this country, which will require some generations of careful breeding to remove. Probably no management, however skillful, could prolong milking in a Texas cow beyond three or four months, and, for that matter, the same is true of many scrub cows in Indiana. When calves are raised, and it has been very unkindly said "there are always enough fools to raise calves," the milking habit of the cow is commonly ruined by the treatment of the first six weeks. Now you may kill the calf at three days old, and sell the *dekin* skin, i. e., you may do this if you are more brutish than the calf's mother and father, and then if the cow is properly fed and milked, she will "hold out" well ten to eleven months. Secondly, the calf may be fattened for the Dutch butcher about six weeks, which is another barbarous practice, as a custom. But if the calf is to be made veal, it must suckle the mother. It can not be well fattened by feeding while so young. But take notice, if the cow is to be worth much to the dairyman after the calf is gone, the latter must not run with its dam either day or night; it should not suck either before or after partial milking, but calf and milker should draw off the lacteal simultaneously, the milker finishing alone in order that all the four parts of the udder are entirely exhausted. The reason for this is plain. The flow of milk is complete from all its sources, and its removal must be even, quick and regular, otherwise it will tend to diminish. Yet the common practice is to turn in the calf and then, after it is removed, sometime when you get ready, to "strip" the cow. But suppose you raise the calf? Then it must be weaned before it is a week old and fed, properly fed, in ways that I will omit to describe here, and both cow and calf will turn out well. But it is the lazy, shiftless and stupid management of the first six weeks that lays the foundation of an early reduction of the milk or its entire suspension. The ill feeding, watering, milking and exposure of the cow to discomforts comprise the other causes of small and brief yield. No milking can be properly done with one hand while holding a cup in the other, and a heifer, the first fruitful year should be persistently fed up and milked as long as she yields a gill a day. So much for the cow which is well treated for dairy purposes by comparatively few. Those who keep dairies for the sale of milk manage the best, except such as are within reach of starch factories. Good butter can not be made from bad material fed to the milk machine. As to butter making by individuals, farmers' wives, we all know what it is in its varied aspects and conditions. While there are some as good butter makers in this State as can be found anywhere, the larger portion of what is termed country butter is of inferior quality when brought to market. Many have not facilities for making a good article, others, and the majority, possess neither skill nor disposition to excel. The market offers little inducement to do well. For when the neat and fastidious old Quaker woman brings her golden stamped rolls, made with unstinted pains to the country store, she generally gets the same price, no more, as she sees paid for some old pipe smoker's white and rancid grease, and is humiliated by seeing the pride of her skillful handiwork dumped into a pine storebox upon a heap of all sorts as varied in tints as Joseph's coat, and far more *strongly* contrasted in odors. An almost total want of discrimination in the country market prevents all stimulus to the effort for excellence. Merchants think they can not afford to lose a rich customer by classing her poor butter, second or third grade, and reducing the price three or four cents on the pound. It is better policy for them to allow full price and then pitch the butter into the back yard. I have known that very thing to be done. The two leading faults of Indiana dairying then are first, too small product from the cow; and second, an average inferior grade of butter and absence of inducement to improve.

Little needs to be said of cheese for some time to come. There is not any passably good cheese made and sold by farmers. There have been and are some attempts at factory cheese, but so far as I have seen the results there are a dismal failure. Even the Ohio Reserve cheese offered in our retail markets here is deplorably bad, and a disgrace to the business. The fact is, that in this damp hot summer climate it is not possible to make, cure and keep a first class article of cheese without costly artificial preparations and appliances. Even when these are provided at much expense, the skilled labor seems to be yet more difficult to supply. There is not much really good cheese produced outside of New York State, and there they still try to cheat by over-coloring and various devices.

What is to be done? I suppose the objects of this association are to advance the interests of its members and to promote this branch of productive industry in the State. What conduces to the one will aid the other. I have no hesitation in saying that the main reliance for practical advancement must be upon organized systems, and the division of labor. Let anybody, everybody produce the milk in large quantities or small and then let skilled hands, aided with the indispensable appointments, manufacture the goods for market. Indiana will never develop any considerable dairy industry on the old plan of individual operations. But with the right sort of factories and creameries, well and honestly managed, she will make this line of business one of the first importance and value to the State. A promising start has already been made; and if the association can adopt some measures to stamp out the cheating that comes of short-sighted avarice, a great stride in prosperity will be made. In this business, more if possible than elsewhere, "honesty is the best policy." A good reputation founded on facts is a fortune, is millions, is everything. A country merchant in Kosciusko county last week, in praising some butter he had to sell, declared it was a better article than your creamery butter; for, said he, "I know what that is. Your city fellows buy a lot of all sort from country stores, work it over, color it, and then sell it as creamery butter." Now, in the main part he was mistaken; but that very thing, I fully believe, has been done in this city, the rascals thinking they could deceive the public in this manner. Thus you see what damage is done to the reputation of creamery business, by the dishonesty of a few men who narrowly imagine that money in hand is the most desirable of all things and dearer to them than moral principle and a good conscience. True economical science is, however, all on the side of factory system in developing the great possibilities of this industry which is capable of building handsome fortunes for thousands, and of enriching the State, turning its rich pasturage into available wealth.

The factory system and the exertions of this association must necessarily look to all the collateral influences. You must teach the corn and hog farmers, or a part of them, the value and profits of the cow, and the great difference between good and poor cows. You must look to the breeding of milk stock. Udder as well as beef must attract some respectful attention upon the fair ground, and the big steer must make a bow to that most charming, to my eye, of all animals, the type of unobtrusiveness and usefulness, the dairy cow. In lifting the dairy business out of a disconnected, desultory and merely pin-money incidental economy into an organized, intelligent pursuit, you will have done for the State inestimable benefit in this: that you add one to its lines of leading productive industries. In its infancy corn and hogs constituted its marketable staples for exportation. If these by some mischance failed, there was little else to fall back on. Within the past ten years wheat raising has been added to the list of great wealth bringing crops, and beef cuts an important figure. But with our magnificent adaptation to grass production, nothing else is wanting but the organized system, the awakening of enterprise, to turn grasses and corn fodder, so much of which now goes to waste, into milk and its manufactured products. It is better than gold mines. Corn may be cut off by drouth, wheat runs a gauntlet of destructive enemies every day after the tiny bayonent pricks the soil till the grain is in the warehouse. The best herds of fattened hogs are frequently swept away by the plague the very week they were depended on to lift a mortgage, but a good herd of dairy cows belonging to a factory system, or even isolated, under the right management, *never* fails. It is not subject to the chances of flood and drouth, frost, insect and disease. It is a sure crop if the farmer does his part. It will hit every year. The old saw, "Don't carry all your eggs in one basket," is wise. In new, pioneer operations, a variety of industries is impossible, but as States grow old and population thickens, industries must spread out, all opportunities must be utilized. Indiana has a very great opportunity here, and the time has fully come to seize upon it. But as I have said, one man can not do much alone, nor many men separately. The day of large dairies manufacturing their butter and cheese at home has about gone by, even in those regions where they have reached the best success. Better methods corresponding to the progress of modern times are to be considered. It is often argued that what we need in this country is manufactures. Let us have them. Let us have factories to work up the raw material that is produced on our own soil. Some States raise cotton for their staple, some sugar; but they grow no grass. The naked red soil, destitute of a rod of green sward in summer, makes the northern man homesick—repels him. We grow grass. It comes itself and stays with us. And there is money in it through an industry which you are this day considering how to promote. Whether Indiana shall come to the front, shall surpass Ohio, Illinois, Wisconsin or any other State in this honest and honorable competition depends, not on her natural capabilities, for these are sufficient, but on the enterprise, activity and foresight of those who seek employment and its rewards for both labor and capital in the legitimate road of prosperity.

SUCCESS OF THE DAIRY.*

BY J. E. THOMPSON, WATERLOO, IND.

Gentlemen: The leading question before this convention to-day is the success of the dairy interest of the State of Indiana. In our previous meetings we have endeavored to show that Indiana has all the requisites of a first-class dairy State, except the educating of her citizens in that branch of industry. We have endeavored to show to the people that the business is profitable, and that first-class dairy goods can and have been produced in this State, and still the people are slow to believe and act. And now the question arises why is it that people will not adapt themselves to this branch of industry. In order that I may not be misunderstood, let me say that it is not desirable that the other branches of agriculture be abandoned or neglected in order that this branch might grow and supercede others that are profitable, but that it might be nurtured and grow up in harmony with the others and become one of the great factors in the wealth of our State. It has been demonstrated by actual tests that gross receipts from cows in this State have been from thirty to seventy dollars per year and some claim a higher figure. But I do not wish to deal in extremes as I have the good of the masses at heart, and wish to deal in simple and unvarnished facts, and do not wish to misrepresent or create a false impression in the minds of the inexperienced. The following question was propounded to me by one of our experienced dairymen to be answered here to-day, as follows, to-wit: It has been demonstrated that dairying in Indiana is profitable. Therefore, why is it that the people have such an apathy to the business. Now Mr. President, I will state a few of what I think are the main reasons for this state of affairs. Printer's ink has a leading place in all the callings and business of this country, and dairying is no exception to the rule. We reach the masses through the influence of the printing press, and I consider it a great blessing, but sometimes we use a blessing to the detriment of others, not that I think the men or the press design anything but the enlightenment of their readers. But we have theorists that use the press to get their views before the people, and whether these theories are true or false is often expensive to demonstrate, and the people of this State have been humbugged so often that they have become skeptical to all new theories, and will hardly believe their own eyes, when it is demonstrated before them. Another reason is, that much of the writing upon dairy business is of such a character that an inexperienced person would calculate that it would take a fortune to start, and besides there must necessarily be a manufactory within reach or there could be nothing done. Then there must be bought some Jersey cows at fabulous prices if butter is to be made, or if cheese then comes in the Holsteins or some other thousand dollar cows, and so on to the end of the chapter.

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* Read before the State Dairymen's Association at Indianapolis, January 6, 1882.

I do not wish to be understood as trying to discourage the breeding of fine dairy stock, for that is not the case. I am glad that it is being done and hope that it will continue, and if possible double the profits from our dairy stock. But I am trying to deal with the subject, in fact, as I find our people to-day.

If our writers would encourage the people to care for the stock of cows we have on hand, and use them to the best advantage until such times as changes could be made without a sacrifice, there would be some encouragement for the novice to begin. When the people learn that feed and care of the cow is one of the largest factors in the profits of the cow, they have learned one of the great secrets of dairying.

The annual election resulted in the choice of J. E. Thompson, of Waterloo, for President, and G. C. Stevens, of Richmond, Secretary.

Adjourned to meet during the State Fair of 1882.

SWINE BREEDERS.

SIXTH ANNUAL MEETING.

Rooms of the State Board of Agriculture,
Wednesday, January 4, 1882.

This association met, Vice-President T. W. W. Sunman in the chair, Wm. A. Macy, Secretary.

The committee on classes of swine and premiums at State Fair reported, and after full discussion on the low premiums paid by Indiana State Fair, in comparison to other neighboring State associations, and also in considering the high position as to wealth that Indiana now occupies; the association directed the committee, Messrs. Jones, Dragoo and Macy, to again petition the State Board of Agriculture to increase the prizes and premiums in swine department.

The treasurer, James Mustard, not being present, is directed to report at next meeting.

The following officers were elected:

President—Dick Jones, Columbus.

Vice-President—Jesse Y. Demaree, Franklin.

Secretary—Wm. A. Macy, Lewisville.

Treasurer—D. L. Thomas, Rushville.

Executive Committee—T. M. Reveal, Clermont; S. Dragoo, Edinburg, and B. L. Mugg, Center.

D. L. Thomas desired to know how much concession should be made on the part of a breeder when an animal proved barren, or a non-breeder.

S. Dragoo. Should make good, barren animals.

D. Jones. If a breeder sells a pig and it is non-breeder, honor demands he should be made good.

Wm. Robbins, of Greensburg. If a pig is sold at buyer's risk, he should be the loser, otherwise breeder stands good. Aged hogs should always be guaranteed.

E. Caldwell, of Connersville. His practice is always to allow the difference between selling price and stock hog price on non-breeders.

Similar remarks were made by Messrs. Macy, Mugg, Thomas and others.

D. Jones suggested the propriety to breeders of not shipping stock C. O. D., but in all cases let the money precede the shipping. This was his practice, and he thought if all were to adopt such a course it would be the safest, and avoid anxiety and much trouble and loss.

All thought such a course the best, and if the individual who wishes to purchase can not place confidence enough in a breeder to order on his word, it would be best to cancel order.

J. G. Kingsbury, of the *Indiana Farmer*, desired to have the opinion of the association on Dr. Haas' swine remedies:

D. Jones. So far as I know hogs that were treated by his sanitary measures and without his medicine, did much better than those treated with his medicine and sanitary measures. He thought it a good appetizer.

S. Dragoo. Knew of cases where it failed, and questioned its widespread reputation.

E. Caldwell. Thought other resources more to be depended upon than the doctor's medicine.

Wm. A. Macy spoke of its complete failure in parts of Henry, Rush and Fayette counties, being fully tested by reliable breeders and well-to-do farmers. May do as an appetizer.

There were some similar testimonies given by other breeders present.

D. L. Thomas read a valuable condensed review of the late publications of Congress on Swine Diseases. He was followed by Samuel Dragoo, with a paper on "The Value and Best Manner of Keeping and Feeding Swine."

SWINE DISEASES.*

BY D. L. THOMAS, RUSHVILLE, IND.

During the past third of a century, wonderful changes have been wrought in all classes of live stock, and none of them bears the stamp of progress more clearly than the improved hog. The "elm peeler" that required two or three years to grow or fatten, has been supplanted by one that can readily be put into market at eight to ten months of age. It enables the farmer to put at least two crops of hogs into market instead of one. But while this product is so quickly created, the farmer neglects to carefully consider the *modus operandi*. If a feeder of a reflective mind, would stop and think when throwing out feed to his hogs, how soon that raw material will be changed into pork, he would be struck with wonder and amazement. In a few months food is changed into blood, bone, hair, fat and muscle of a large hog.

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*Read before the State Swine Breeders' Association.

Feeding the improved hog under pressure, so to speak, necessitates a rapid assimilation of food. The improvement and speedy development impairs the vitality of the hog, and, in my judgment, makes the tender pig more liable to disease.

And since we have changed the nature of the hog, we have overlooked the importance of keeping pace with a corresponding change in his general treatment. He is out of his natural climate, else he would be supplied with a better coat to protect him from our climatic changes. Indeed, the breeder's fancy demands that the hog's coat be made finer and thinner, so that he will be still poorer clad for our climate. So we have taken the hog out of his native climate, and entirely changed his habits—two radical changes. Now, under such circumstances, can we successfully raise him in a reckless, slip-shod manner?

In early boyhood I saw the "elm peeler" roaming the forest at will. His omniverous habits met with a great variety of food. He ate mast, berries and reptiles. With his long nose he dug up worms, bugs and roots. He had access to all the native plants and herbs, and to the ashes and charcoal found in the "clearings" of the pioneer. The alkaline salts of the soil were in easy reach. His instinct pointed out whatever was required to correct irregularities in his system. The forest sheltered him from storms and piercing winds. He enjoyed healthy surroundings. Now the forest is changed to fertile fields. The hog is brought from nature's shelter to open ground one-fourth clad with a suit of fine, thin hair. He keenly feels every climatic change. The modern hog wears a ring in his delicate nose and lives upon a carpet of sod, while worms and bugs are propagated beneath to prey upon the next crop of grain. He gets no flesh to eat; native herbs have disappeared; nor can he dig for roots. He is confined generally to one diet—grass or grain. At fatting time he is put in a pen and fed in the mud, sleeps in the mud and storm, gets sick and his owner can't understand it. One hog raiser furnishes no protection from climatic changes and his hogs contract cold and die. Another wishes to "change" his hogs and turns them from sheltered beds into exposed fields, and diphtheria sweeps away a large per cent. A third, more careful than the average, builds a tight hog house with little or no ventilation. Of a cold morning a dense vapor is rising and the hogs are nearly suffocated, and when called out to feed they are thoroughly chilled. Pneumonia numbers its victims. A fourth neglects to give his hogs the "preventives" that they used to get in the forest, and their systems are clogged with parasites. The intestines of some are punctured, the lard worm preys upon others, and still others are afflicted with lung worms. Death reduces his herd. Now, let these hog raisers meet and talk over the situation. Without *carefully* noting the circumstances attending each herd, nor the symptoms when sick, without a single post mortem examination, they unanimously agree that all their hogs died of "cholera," and adjourn *sine die.*

The foregoing prepares the way to say that in my humble opinion, when we, the swine producers of the United States, come to give more earnest thought to our business; to study the nature and wants of the hog and supply them; to apply more practical, common sense rules in the general management of our herds. Then the mortality among swine will be greatly diminished.

What I have said will suggest remedies, in a great measure, for the evils mentioned.

But the thoughtful breeder can easily manage all these difficulties in comparison with the terrible malady—*swine plague* or *fever*—that has been so destructive and so little understood. I have always read with interest everything I could find bearing upon this subject, and also made it a point to converse freely with persons who have suffered financially by this disease. But I never had any practical experience till last fall, when I lost a few fine Poland Chinas. Fortunately at that juncture I had access to United States agricultural reports treating upon the identical disease, which I studied carefully and with great interest. And I wish to present briefly my own observations, and especially the germ of the reports mentioned. In August, 1878, Commissioner Le Duc., having been voted an appropriation by Congress to defray expenses, appointed a "commission to investigate and determine the causes producing, and if possible discover remedies for, some of the more contagious and destructive diseases incident to domesticated animals." He appointed examiners in the States of New York, Indiana, Illinois, Iowa, Kansas, Missouri, North Carolina and Virginia. Some of those examiners pursued their investigations at intervals till 1880. The result proves that that was the most gigantic step ever taken in this country toward understanding and stamping out contagious diseases. All the diseases heretofore mentioned have been confounded with swine plague. It is a distinct and separate disease, and was imported, like pleuro-pneumonia among cattle. It has played havoc among herds under every conceivable circumstance and respected no breed from the veriest scrub to the most highly bred. No "specific" or "sure cure" has been found, and probably never will be. Preventive and sanitary measures should always form a part of the general management of swine. Yet there have been outbreaks that would seem to baffle sanitary regulations. In one instance large numbers died with the plague that had fine, shady range on rolling ground and fed principally on the buttermilk of a creamery with a small ration of corn. In another, one hundred and seventeen head (nearly whole herd) died, that had a range of a large clover field and fed the slops of a city hotel. A herd fed the offal of a slaughter house, at Charlotte, N. C., with other food, was the first to take the disease in that locality, and suffered greatly. And quite frequently it breaks out among hogs following fat cattle. Dr. Salmon, of North Carolina, says hogs have died to an alarming extent from the mountains to the sea board; and that he "met with hundreds of cases where animals had large pastures and other food in addition daily, where such popular preventives as salt and ashes, sulphur, tar, oil of turpentine, charcoal and copperas were freely and regularly given, where the majority of animals were neither too fat to be vigorous nor so poor as to be wanting in this respect, and yet from fifty to ninety per cent. succumbed to this affection." He also found it "as fatal in the elevated and healthful west, with its immense mountain ranges, as in the malarious east." Further, "the disease rages irrespective of these climatic and hygienic extremes; and this becomes still plainer when we add that in Swaunanoa township of Buncombe county (mountainous) the loss reached sixty per cent."

The Commissioners held, probably, a thousand post mortem examinations, made numerous experiments, tried many remedies and preventives and learned the observations and experiments of hundreds of farmers. So from all sources they have gathered a valuable fund of information.

Dr. Dunlop, of Iowa, in pursuing his investigation, gives this important rule: "If the herd is not doing well, if they do not eat well and appear less active than usual, at once examine the tongues of a few and notice the color; if the tongues are red and contracted give sour slop or turn them on clover pasture or on green food, and they will at once improve. If their tongues are large, pale and flabby, give corn, corn meal, cooked root vegetables, and add soda to the feed, or soda and milk, but give no sour slop. The large, white, pale tongue shows that the stomach and blood are in acid condition and need alkalies; the contracted red tongue shows a sub-acid condition, and that acids or sour remedies are needed. For years the farmers' journals have lauded clover fields, and have advised keeping swine upon a clover during the entire summer, on the score of economy of feed and health. As far as it goes this is good advice, and yet following this advice has been the chief cause of the spread of the contagious diseases among swine. When the clover range is on clay soil, or the hogs have access to clay banks, and the use of rings is avoided, all will go well," otherwise the treatment invites disease.

Dr. Detmers and Prof. Law tried many experiments by inoculation, and found that the virulent matter would take after being frozen, dried, or preserved in liquids for a year. They successfully inoculated calves, sheep, rabbits and rats. The virulent matter is found most concentrated in the excrement and urine of hogs. Animals feeding with diseased hogs are liable to devour the virus and spread the disease. Birds may carry it on their feet and alight on hogs miles away, and by their feet coming in contact with a wound inoculate the plague. Crows and buzzards may carry germs of the disease in their excrement to distant herds. In various ways it can be communicated. The plague is not considered a sporadic disease, but is communicated by inoculation, or the animal taking the germ into its system in its drink or food. The germ has been detected readily in ponds and streams frequented by sick hogs. Seemingly well authenticated instances are cited where the disease has been spread by the wind, water, hauling dead hogs to rendering tanks, shipping sick hogs on railroads, and hogs eating portions of dead animals that have been carried into their pastures by dogs or running streams. But these are contradicted by herds of hogs remaining healthy in lots adjoining the pens of sick hogs; by healthy herds not contracting the disease when drinking daily from the same stream, and just below where sick hogs drink and wallow; and last fall hundreds of hogs that had died of the swine plague, were hauled to the Rushville rendering tank, and I could not learn of a single hog along the highways contracting the disease; and the offal (lungs, liver, etc ,) of those dead hogs were thrown out and consumed by a herd of hogs and pigs raised in the lot around the rendering tank. That has been the custom of the proprietor for years, and he never has the disease in his herd. These observations go to show that we have not yet discovered, to a certainty, how the disease is spread.

SYMPTOMS OF SWINE PLAGUE OR FEVER.

The general symptoms nearly always present are: Drooping ears; dull look of the eyes; staring appearance of the hair; back arched; the flank tucked up; stupor; loss of appetite; disposition to lie down with nose hid in the bedding; staggering gait; shivering and more or less coughing; offensive smell and peculiar color of excrements. Other symptoms are often present: vomiting; constipation, sometimes purging; bleeding at the nose; eruptions on the ears; mucus in the corner of the eyes; partial or total blindness; accelerated and often laborious breathing; spasmodic contraction of the abdominal muscles; vitiated appetite; and sometimes the skin, lips, gums and lower jaw bone become ulcerated.

The morbid process, though essentially the same, may have its seat in many different organs or parts of the system and produce a great variety of changes. Hence, the same disease presents different aspects in different animals. The disease may attack the brain, lung, heart, liver, pleura and pericardium, peritoneum, lymphatics, spleen, all mucous membranes, and even the skin. The pulmonal tissues and lymphatic glands are invariably affected.

When the attack is violent and its principal seat is located in any of the vital organs, death is liable to ensue at any moment. When an important organ is paralyzed there can be no hope of recovery. In less violent attacks a rational treatment may assist nature in throwing off the disease; while animals having a mild attack, particularly of the less important organs, can recover without treatment. Last fall I had five head attacked with diarrhœa. Two, from the first, seemed to be beyond human aid. I gave the other three (in fact all five) essence of Jamaica ginger, which seemed to help them and they recovered. But the idea of an absolute "specific" is an absurdity. When such a thing shall have been discovered physicians will also have discovered specifics for all *our* ills, which, when placed in every household, will arrest diseases and the human family will cease to die.

Those commissioners tried every remedy they could devise, and heard battallions of farmers relate their treatment, including many "sure cures," but found nothing that proved satisfactory. But in the way of *preventives* they seemed to have solved the problem. Dr. Detmers made a series of experiments with carbolic acid, iodine, hyposulphite of soda, etc., and succeeded remarkably well in arresting the spread of the disease. Carbolic acid is recommended as preferable on account of cheapness, leaving no bad effect, and being easily administered by any one. In his experiments he took herds containing sick hogs and separated the sick from the others, and gave ten drops of cabolic acid to every hundred pounds of live weight, in pure water. In no instance were there new cases of sick hogs. Pigs were inoculated and others fed infected food and given the acid, and no evil effects followed. So it seems an absolute preventive has been found. Swine plague has existed in this country for over a quarter of a century, and spread to twenty-nine States and Territories. Yet it may be stamped out if the sick hogs are speedily destroyed or separated, preventives used among the healthy hogs and sanitary rules observed.

I am a firm advocate of the popular preventives, such as salt, ashes, tar, sulphur, black antimony, lime, copperas, etc., for these will expel the parasites, and save thousands of hogs annually from the ravages of other diseases first mentioned. And without access to these the hog will become debilitated; and it stands to reason that he would be in poor condition to resist the attack of the plague. If the hog's surroundings are healthy and his physical condition good he is not likely to have any disease. We may think we have everything about right when disease appears in our herds. But there is a wrong somewhere. Faulty food, impure water and climatic changes invite disease. The breeders' best safeguard is eternal vigilance.

MANAGEMENT OF SWINE.

BY SAMUEL DRAGOO.

Mr. President and Brother Swine Breeders:

The subject that I shall introduce is one of such magnitude that I hardly know where to begin. From March 1st, 1880 to March 1st, 1881, there were slaughtered 12,243,353 hogs; supposing that they average two hundred pounds it would make 2,448,670,800 pounds, that at five cents per pound would make the enormous sum of $122,433,540.00. In view of the magnitude of the pork trade and our extended commerce, and from the fact that the Central and Great Western States will continue to be the home of the porker; and foreign nations are largely looking to the United States for their supply of pork, notwithstanding the recent trichinæ scare, the fact is American pork is among the best, and other nations are not slow to learn this. In view of this fact it behooves breeders to know just how to make the most of what they have to feed. It must be remembered that when we feed for profit we must have animals well bred and with an inherent aptitude to fatten; with such animals judiciously managed they become among the most profitable in farm husbandry. I will lay down a few plain rules that will answer in most cases. Suppose the breeder has good sows to begin with, and in my judgment there is nothing better than good vigorous, square, broad Poland Chinas. Such sows make the groundwork of a valuable herd so far as profit is concerned. In the second place we must have an A No. 1 boar; he must be well bred and well farmed, as the male stamps his character in a very high degree on his offspring. Right here pedigree comes in on both sides and especially on the boar's, as no breeder can afford to breed from grade animals. While the produce of a high grade may often be very satisfactory, yet we never know when or where the current of scrub blood will crop out in poor feeders or in ill shaped animals. For this reason it is money in the pocket of the farmer to breed from the best all the time, as nice smooth hogs are worth from one-fourth of a cent to one cent more per pound than rough ones, which on fifty to one hundred hogs would make a difference of from thirty to three hundred dollars. This would be a very nice thing and would considerably more than pay for a good boar. If we have well shaped, vigorous sows and a well shaped, vigorous boar; animals in such condition if carefully fed on good wholesome food and plenty of water and grass, or artichokes, would be healthy, and as health vigor is what we want in breeding, and without that we can not breed healthy animals, we would fail.

It is a fact that some articles of food contain more material for fat than others, while others are adapted to building up the bone and muscle and other constitutional parts of the animal. Corn contains more fat than any other food, yet its constitutional strength is lost in its lack of sugar, salts and albumen, consequently an animal fed on it exclusively will have a weak fatty muscle with an open porous, bone, tender fatty stomach and intestines, and will readily become a victim to any epizootic influences that may be carried to him in the atmosphere. The pea contains more nutritive matter for bone and muscle than any other food, and excels all others except corn and oats in fatty matter, but the crop is not a profitable one owing to the labor required in producing it. If we desire hogs of a strong constitution that will not be subject to disease, it will be well to feed them the artichoke, because of large amount of sugar, starch and salts which it contains, is easily converted into material to supply the bone and muscular system. Every farmer ought to raise a few acres of artichokes for his hogs, as they can be raised very cheaply, and as a preserver of the health they are excellent. If we would raise more roots and grass, especially blue grass and clover, with artichokes, and change frequently, we would seldom, if ever, have disease. I consider that, when epizootic disease attacks a herd of swine, especially the hog cholera, they must be changed and put into new pasture; and if they have been fed corn, stop that at once, and feed milk or boiled oats, change every few days from one pasture to another until they are well. I have little faith in drugging, believe it does more harm than good, and if breeders would adopt sanitary measures and live up to them rigidly, he would be quickly repaid in the robust constitution of his animals. First, plenty of pure water, avoiding the possibility of their getting foul water, especially that which falls on feed lots and pastures and runs into low places. Such water becomes poisoned, and is one of the most fruitful sources of disease. Second, a good dry, clean place to sleep; and in mid summer or from the time that rag-weed and other similar weeds are in bloom and until frost kills them, swine ought not to be allowed to run through them, unless cut with a mower, and should be kept out especially in the fore part of the day, as the dust and dew affect the lungs. By following these directions, and those of changing in pasture and food, I am satisfied that swine would be as healthy as any other farm animals, and will pay a larger profit on food consumed than any other animals I know of. This has been my experience.

On motion, the thanks of the Association were returned to Messrs. Thomas and Dragoo, for their very interesting papers.

J. G. Kingsbury made some valuable remarks on the objects of the association, and assured us that the *Indiana Farmer* was ready to print any matters of interest in this department of husbandry. A number thought that the *Farmer* was increasing in valuable information, especially in the stock department.

Owing to a severe snow storm a number of our members were prevented from attending, but as a whole, the members thought the occasion was a profitable one.

On motion, the Association adjourned to meet the first Tuesday after the first Monday in January, as provided by the constitution, or on call of Executive Committee.

WM. A. MACY, Secretary.

STATE WOOL GROWERS' ASSOCIATION.

PROCEEDINGS OF MAY MEETING, 1881.

ROOMS OF STATE BOARD OF AGRICULTURE.

The association met in semi-annual session, Wedndsday, May 25th, and was called to order by Cal. F. Darnell. The President and Vice-president being temporarily absent.

S. W. Dungan then discussed "What is the best mode of caring for the different breeds of sheep, shelter, etc.," as follows:

I like educated farmers. They are always ready to give a reason for their acts, because they always act scientifically. But this is not so with all farmers. Many move along in a slip-shod manner, guessing at results, and most generally come out with the balance in the wrong column of the ledger. Farming now requires educated labor to make it profitable and elevating.

What ever would be good management in one flock or breed would be good for all.

Select sheep of good vigorous constitutions. Breed as early as ewes come in heat; an early lamb is worth one-and-a-half late ones. Ewes carry their lambs from 147 to 153 days. I keep a register of ewes when served, and have my ewes all ear marked. One or two days before lambing the udder becomes red and looks inflamed. I watch them very closely till the lamb sucks.

Every good shepherd should attend closely to his flock every day. I speak from experience.

I am always on hand at shearing time and stay right with my flock; should not shear with old dull shears but have a nice cutting pair. I always look at every hoof and if turned under and crooked, pair it off nice and smooth, and never allow them to pass after they become lame. Would always dip lambs ten or fourteen days after shearing; shear tolerably early and shelter if there comes cold rains.

I wean my lambs and give them good fresh pasture; always learn them to eat before weaning; feed ground oats, corn and bran, one-third each. Oil meal would be excellent also.

I would urge that no wool grower goes out of the business now because wool is low. You can keep your wool and the price will be better by and by. It will not shrink in weight if properly baled and tied.

I would always provide shade and shelter for sheep. I clean out my pens in winter every week. But do not believe in close confinement, as sheep wants plenty of fresh air.

J. W. Robe. Do you tie your sheep while shearing?

Yes.

J. L. Thompson. I object to tying while shearing. Trim hoofs and tag about the 1st of April.

J. W. Robe. How do you tag sheep?

I make a trough like a saw buck, seven feet long and fourteen inches deep, so it will hold two sheep at once. Then lay in the sheep back down and rump just over the end of the trough, and cut off about three-fourths of the length of the wool around the rump and all off from the bag up to the root of the tail.

When I wean my lambs I do not put them on a fresh pasture, for fear of scouring; make the change gradual. Do not clean out my pens as often as Brother Dungan, but bed-up when ever needed to keep them dry and clean.

I. J. Farquhar. I wean my lambs by making a creep hole into a separate apartment in which food is placed, and when they get to eating good, shut them off from the ewes entirely at the proper time. Ginger and salt will make ewes come into heat earlier and cure snots.

Hon. Lee McDaniels. I clean my sheep stables once a year. I see my sheep every day. If ewes have twins and one gets away from the ewe and she refuses to own it, rub the two together. I tag early in spring. Dock and trim, first to middle of April. I have a block eighteen inches wide and eighteen high, place but on the block and cut the sack half off, this lets the testicles out of the outward sack; gather them by thumb and finger and pull them out. To dock, place the feet of the lamb down with tail on the block, with a little pruning axe and mallet cut the tail one and a half inches long. Push up the skin so that when cut it will slip down and cover the end of the bone. I tar the tail and sack with the fingers. I don't allow a sheep to come up twice behind, I sell him. I improve my flock by selling out those that have poor fleeces, and keep only those of good fleece and right shape.

George L. Merritt, woolen manufacturer of Indianapolis, being present, was called on and said:

"We, as manufacturers, like to co-operate with the wool growers, but your meeting is at the wrong time of the year for us to meet with you. Our houses are now full of farmers coming in with their wool, and our time is required at our places of business.

A member. What is the reason wool is so low in price now?

Mr. Merritt. It was very high last year. Speculators made a corner, and many manufacturers sent to Australia and Europe for their year's supply. The consequence was that about 150,000,000 pounds were imported last year thus leaving much of the last year's clip in the farmers' and merchants' hands. So we come to this year's clip with lots of old wool in the country.

A member. What wool brings the best price now?

Mr. Merritt. Medium wool is the most valuable now. Say half-blood Merino, will bring the best price.

Messrs. Merritt & Scott being selected as a committee to pass on the different grades of wool exhibited by different members of the association, reported that—

S. W. Dungan have first and second premiums on long wools	$2 00
Uriah Privett, first and second premiums on medium wools	2 00
J. L. Thompson, first and second premiums on fine wools	2 00

It was moved that a vote of thanks be tendered to the committe for their kindness in passing upon the grades of wool. Carried unanimously.

I. J. Farquhar moved that an order be drawn on the treasury for the amount of the above premiums. Carried.

T. W. W. Sunman moved that a committee of three be appointed on program. Carried; and Messrs. Sunman, J. L. Thompson and I. J. Farquhar were appointed, and reported the following.

The committee on program for January meeting, 1882, made the following report, which was adopted:

Address of President—Hon. F. Beeler, Indianapolis.

How shall we sell our Wool?—T. Wilhite, Middletown.

What is Tariff, and what has it done for Sheep Husbandry?—J. W. Robe, Greencastle.

How to Castrate and Dock Successfully—A. McClelland, Door Village.

What course shall we pursue to Increase the Number and Quality of Sheep in Indiana?—Cal. Darnell, Indianapolis.

How shall we supply the Looms of the United States with all the Wool they Manufacture?—Robert Mitchell, Princeton.

Sugar Beets, Mangel Wurzel, Rutabagas, Carrots and Parsneps in relation to Sheep Husbandry—T. W. W. Sunman, Spades.

What is the best mode of Wintering fifty or more Sheep?—D. H. Thompson, Waldron.

Characteristics of Shropshiredowns—Morgan & Cotton, Newman, Ill.

The following paper was then read by Uriah Privett:

The manner and time of breeding ewes is not all that we have to consider. In the first place to keep imperfect animals will not pay. We want to breed such ewes as will improve our flock instead of degrading it; for the value of the animal will be measured by its value for mutton and wool. There is nothing sacrificed here either in carcass or fleece, for the mode of improving the one will also improve the other. Sheep husbandry, like everything else, has to be studied. Some new beginners think all that is necessary to be done is to have a big flock, turn them out on pasture. They expect big profits with little labor. They read the reports from the different farmers over the country that have small flocks, and they seem to think that big flocks will pay in proportion.

I will give you my ideas of the subject you have assigned me. I always aim to breed my ewes from the first of October to the first of November. My way of breeding ewes, as a general rule, is not to allow the bucks to run with them. When

I corral my sheep at night I turn out my buck with the ewes, and when he has served one or two ewes take him out and feed him. The next morning before I turn out the buck take out the ewes that he was with the night before, and if there are no ewes in heat let him run with the ewes taken out to make sure that they are served. Then I take the sheep off to the pasture and feed the buck, keeping him where he can not see the ewes so that he may not fret. I think we should feed our ewes a little when breeding them. Before commencing to breed I always tag my sheep. I will not allow a long tailed ewe on the place. I have known men to miss a whole crop of lambs by neglecting this. I sometimes put my ewes if needed.

I aim to keep the ewes in good condition all winter, by so doing have a greater flow of milk for the lamb. I do not believe in giving much corn feed, it should be accompanied with something else that will help to keep them fat. I find clover hay is very good; when sheep are kept fat on corn principally it causes fever in their udder when lambing. Ewes carry their lambs from 145 to 150 days. Just before lambing I take out the ewe from the flock, keeping her close to the others so she will not fret. Do not feed corn the first day or two after lambing; if the ewe seems to be weak give her one or two messes of gruel with two tablespoonfulls of port wine in it. If you want your lambs to grow fast feed them on corn meal, and the way to do this is to have a pen in the shed where the lambs can go in; and have narrow, shallow troughs low down so that the lamb can drop his nose on top of the meal. The first lamb or two you can learn to eat out of your hands when about ten to fifteen days old and these will learn all the rest. The lambs will go in their pen at night to keep the old sheep from tramping on them. Always clean out the lamb's troughs before feeding them. This pen should be in the warmest part of the shed. Feed your lambs till they have been on grass a few days; do not stop feeding short but gradually; sheep wants to be on good open pasture having shade in different parts so they can change their resting places, and that will be better for their health. Sheep should be salted once or twice a week; watch them and if they get snotty noses give them powdered resin with their salt. Tar is also very good. Take leaf tobacco and dry it on the stove, crush it fine and put in the trough, this too is very good. I do not believe in giving much sulphur. Think that dipping sheep is best to kill lice and cure diseases of the skin. Dip your lambs and old sheep when you shear every year, and you will have healthy sheep as a general rule.

The time for weaning lambs I think is from the 1st of August to the 10th. Put your lambs on good fresh meadow pasture where the meadow was cut early and give them plenty of water or they will fall off. Watch your ewes and see that their udders do not spoil—do not turn.

I will now give you my reason for not breeding early. If I understand rightly we want to make the most dollars with the least labor. Now, we all know very well that if we have our lambs to commence coming the first of January, that we have two months of exposure in cold weather. Good flock masters will look after their sheep at night as well as in the day time, if they think their help is needed, and they take considerable more feed and attention, and the difference in size is but very little the first of October following, and you will lose more lambs and have more stunted ones. My experience is that the first month a ewe will give a good flow of milk after dropping a lamb, and after that she will not, and consequently if she drops a lamb the first of March she can keep it growing rapidly till she can get something green to eat and then she will continue to give a good flow of milk, and I will give my reason for not having late lambs, especially in breeds of fine sheep. We want to sell our buck lambs for breeders, and when they come too late they do not get large enough for service in the fall, and they will not winter so well, and I am satisfied they will not make as large sheep, and it is harder on the ewe to go through the summer. It will not do to wean the lambs as soon as early ones. I will give you one more reason for not having lambs to commence coming before the 1st of March, and that is, when your lambs commence coming the first of March they will all, or nearly so, come inside of fifteen days, and then you have your lambs nearly the same size. Nothing looks nicer than to go into a fine flock of sheep and see them all of one size. Your lambs will sell for a better price on an average, your flock won't look like it had cullings in it. On the other hand, where you aim to breed early lambs your ewes will be dropping lambs up till the middle of March, and then in breeding your ewes in the fall there is not near so much labor commencing the first of October.

Mr. Conkle. What is dipping? I have used tobacco stems.

Mr. Dungan said that there was now being made by Dr. Pritchard, of this city, an excellent dip to kill ticks and cure scab. I have just tried it and it does the work. I think it very important to dip. It cleans the skin and is otherwise beneficial. Would dip about two weeks after shearing. Have a box 30 inches deep, 22 to 24 wide, 8 feet long.

Mr. Darnell. Have tried the McDougal dip of England.

Mr. Thrasher. I keep my sheep fat and have no ticks. Think forty or fifty sheep more profitable than a flock of one hundred or more. Sheep should be changed to different pastures, and always to a better one.

Mr. Pearson. Had five lambs dropped in May; in the fall I turned them in a corn field and they got very fat, but were full of ticks.

Mr. Pursell. My brother has a bunch of extra fat sheep, and the lambs are full of ticks. I have a flock of long wool sheep in good condition and plenty of ticks.

Mr. Farquhar. Have had lots of ticks, but they left the ewes when sheared and went to lambs. I feed slop feed. Ewes suckled down, but lambs look well even with ticks.

Mr. Marlatt. What is the best feed for ewes after lambing? Chop mixed with equal parts of bran, corn meal and ground oats, is excellent.

Mr. Darnell. I feed sugar beets and clover hay.

Mr. Thrasher. I feed all the corn they want.

Mr. Conkle. I give one-fourth teaspoon of sulphur and one-fourth teaspoonful of black pepper and wash my sheep regular every year. I have handled sheep for forty years, and at times had five hundred. Always look nice and healthy. Stock, Cotswold, Southdown and Bakewell.

Mr. Smith. Will sulphur produce catarrh?

Mr. Darnell. I use one pint of sulphur to seven of salt, and have never had any bad results.

President Beeler. I have never had any either.

Mr. Pearson. Can you feed too much sulphur?

Mr. Thrasher offered the following resolution, which was adopted:

Resolved, That sulphur is the antidote to ticks, and if properly fed does not injure sheep.

Adjourned until 9 A. M. to-morrow.

SECOND DAY.

NINE O'CLOCK A. M.

Association met, President Beeler in the chair.

Hon. Lee McDaniel read the following paper on

THE CROSSING OF DIFFERENT BREEDS OF SHEEP.

Mr. President and Brother Wool Growers.

I have been appointed by your executive committee to discuss the crossing of the different breeds of sheep, of which I have four on my farm to-day, the Cotswold, the Lincoln or Leicester, the Southdown and Merino. Now I think I have these breeds as near thoroughbred as the country will afford, for I never stop on the price if the animal suits me. And, having plenty of good blue grass and running water and good sheds, the work of crossing and testing seemed naturally to fall on my shoulders. I also had a great desire to test the crossing of the different breeds, so that in one short essay I might give to others the result of seven years losses and crosses with different breeds of sheep. I will commence by stateing what will not do, and why. It will not do to cross the Merino with the Southdown, because you gain nothing in size, and you still have the ragged Merino clip, with close matted wool that you can scarcely get the shears through when shearing. Now this is one cross I would never make. The Merino as a breed can not be grown successfully on a great portion of the soil of Indiana, because it is too low and black, their hoofs will grow crooked in spite of every effort in trimming. They will take the foot-rot and scab. So you see we must cross, if we expect to retain any of the blood of this noble little animal. Now I do not object seriously to any other cross that we might make with the different breeds, but I do object to some breeds as a breed. Namely what we commonly call Canada sheep. They have given me more trouble and loss than any sheep I ever handled. I do not mean Cotswold, for these sheep of which I am speaking, are smooth-faced, long, big ears, with a sleepy look and long, curly, wavy, open wool. Will not stand our cold, rigid winters; but one cross with a Merino or Southdown buck will give you a good sheep, yet I would much rather have the good, old, hardy Cotswold, with a never failing sign known as a top-knot or tuft of long wool on its forehead. Now I do not feel like pulling down any breed or kind of sheep for they are all good in their proper climate and handled by experienced herdsmen; we must raise the kind of sheep that do the best in this climate, and the kind of wool that is worked up in the United States, and that sheep is made to-day by a cross of either the Southdown or Merino buck on a good long wool ewe, especially the Cotswold with a Southdown buck. The first cross will give you just what the Oxford or Shropshire-Down is from, but they have been bred longer in a line, and their prepotency has a tendency to reproduce itself. Now this Southdown cross has length, strenth and fineness, to pass as No. 1 delaine wool. If so it stands at the head of the list in value per pound. The weight of the fleece is fair; but no twenty-six or thirty pound fleeces, twelve to sixteen pounds being the heaviest. Now, gentlemen, it is not worth while to remind you of the past winter, *you will never forget it.* Every person's lambs came at the wrong time. Every manner of disease came up, and the result was, thousands of old sheep and lambs died. The present clip will be one-third less and lighter; the price at present is extremely low; everybody is discouraged; hundreds will go out of the business. They rushed in last year when everything was booming, inexperienced too, and last winter cooled their zeal or ardor, and they are going out as fast as they came in. Now is the best opening for the true minded shepherd I ever saw. Beef is the highest we ever knew it. Mutton must take its place. We can raise a sheep each year, it takes three years to raise a beef without loss. A cross of early Southdown lambs will sell at eight cents per pound; and if fine wool gets higher, we can cross our ewes with Merino buck, and be up with the market in one year. All we want to make money with sheep is a proper education.

Hon. Robt. Mitchell. How are Shropshires and Oxford-Downs produced?

Lee McDaniels. By crossing Southdown bucks with the Cotswold ewes.

Mr. Mitchell. Don't we begin to need light woolen goods, owing to our climate? and if we all produce the long wool we shall not have the wool that our markets demand.

President Beeler. We should pursue a straightforward course, and if you are breeding sheep that pays, keep on, but if not paying, change.

W. W. Thrasher. Cotswolds improve every other breed upon which they are crossed, so with Short Horns. I want a long thick wool-sheep, and the Cotswold is the best sheep; weighs more, and shears more pounds of good wool, and are an excellent mutton sheep. I would always cross a Cotswold with common ewes.

S. W. Dungan. Always breed a thoroughbred buck.

Mr. J. Conkle. I would cross Cotswold bucks on Southdown ewes. It makes an excellent sheep.

Lee McDaniels. Would buy common ewes and breed a long wool buck to them. Select then the best of this cross and then breed a Southdown buck on this Cotswold cross. It is very important that we have the long wool breed pure.

J. L. Thompson. I would start with the Shropshiredown, but think like President Beeler, we ought not to skip around and be always hunting and experimenting with a new breed.

I. J. Farquhar offered the following resolution:

Resolved, That we need all the improved breeds in their purity to fully meet our wants, and to establish the most profitable breed for the general farmer. Passed unanimously.

Dr. R. T. Brown being present, favored the association with a short, interesting speech. He said: Impressions of childhood often stick to us through life. One of my brothers cared for cattle, one for hogs, and mother the hens. I took care of the sheep and protected them from dogs and wolves, and have all through my life been looking out for a good place to raise sheep. Indiana is a good place to raise sheep. They will live here the year round. Glad there are different breeds of sheep for we need them all. It was long before machines could be made to use the long wool to advantage, so with the Merino. The common wool was rolled, but the long wool could not be rolled, but had to be lapped, and thus we have our worsted goods. It is thus with flax, while cotton and fine wool are rolled.

A paper was then read that had been prepared by Hon. Wm. Hodson, of Canada. He was assigned "The Shepherd Dog and His Characteristics," but by some mistake wrote the following on

COTSWOLD SHEEP:

To the President of the Indiana Wool Growers' Association:

In compliance with your desire that I should write an essay on "Cotswold Sheep," it will only be necessary with a breed of sheep so well and widely known as the Cotswold, to notice briefly their history and a few of their leading characteristics.

By many they are supposed to be the original breed of the long-wooled sheep, as being the only ones mentioned by early writers, and that they derived their names from the "cots" from which they were fed in winter, and the "wolds" in which they pastured in summer.

Gloucestershire in England may be said to be the home of the Cotswolds, and whoever has heard of the Cotswolds, has heard of Cirencester as being the city where Cotswold breeders "most do congregate."

For the last five centuries the Cotswold has been well and widely known in England, and has been a source of immense revenue to the breeder and others interested in them.

During the greater part of the sixteenth century their wool was worth four shillings per pound, being wholly used in the manufacture of the better fabrics of that time.

In the sixteenth century they are described as a coarse, large-boned, long-wooled sheep, but since then they have undergone many changes.

At the present time their large frames, fine countenance and full fleece give them an appearance and pre-eminence such as no other breed of sheep has ever yet attained.

The Cotswold sheep of to-day has a large wide frame, covered with an abundance of wool; the head is large, wide across the forehead, and covered with wool; ribs well sprung, prominent chest, deep foreflanks, nicely rounded rump, and moderate sized bone.

Many of our "more fancy" Cotswolds to-day are gray in the face and legs, which adds so much to their appearance that it is difficult for the breeder to dispose of others without their marks.

The increasing demand for mutton in Britain, and the facilities for transportation so great, it becomes the breeder on this continent to supply this demand with the sheep that will produce the most wool and mutton for the least food consumed. The question arises, which is that breed?

The experience of the breeder, the feeder and the shipper is undoubtedly in favor of that old and grand breed of sheep, the Cotswold.

In closing, let me say that if these imperfect and hastily written notes can only add one more to the number of those already interested in this great and grand breed of sheep, I will feel more than amply repaid.

HON. WM. HODSON, Canada.

J. L. Thompson then read a paper on What is the most profitable sheep, considering size and keep, for the common farmer, and how to produce it:

THE COMING SHEEP.

BY JOHN L. THOMPSON, OF GRANT COUNTY.

Gentlemen of the Indiana Wool Growers' Association:

What is the coming sheep, considering size and keep for the common farmer, and how to produce it?

The common farmer must have a sheep adapted (as nearly as possible) to his circumstances and mode of treatment until he can be educated to better treatment.

Will the high kept and high priced English breeds meet his wants? As far as my observation has extended they have failed to satisfy, as there is not one "common farmer" in fifty that will bestow the care and attention that is required to keep them up to their former condition. And more, he is generally either unable or unwilling to pay the price such sheep can be bought for.

Then "what is the most profitable or coming sheep for the common farmer?"

Certainly the one that will produce the most valuable fleece and carcass with the least care and feed. But for those who know how and *will bestow* the necessary *care, as a rule*, that breed or flock pays best that receives the greatest care and attention.

Have we a sheep adapted to the wants and requirements of a common farmer? I think not fully. The Merino, at first thought, seems to possess more of the requirements than any other distinct breed within our reach; yet there are objections to it. It can stand the neglect and short keep that falls to the lot of the average flock better than any other. Yet there are some things that even a "little knotty" Merino can't stand. It is more liable to be attacked by maggots if neglected than other breeds, on account of the amount of yolk in the wool. They do better and are more profitable when kept in lage flocks than any other breed, as is proven by the fact that in all the great wool growing countries the Merino is now kept to the exclusion of all other breeds.

They are more difficult to shear than other breeds, and I have my doubts about the average "Hoosier" ever having the time and patience to shear the full bloods. The common farmer keeps his sheep poorly, and he must have a sheep that can stand this treatment and still do well; and to do this they must be close wooled to stand the storms, and good heavy shearers of medium wool.

This "coming or most profitable sheep" can be produced only by judiciously crossing our common flocks with rams that produce medium results. To be more definite, if your flock is inclined to be coarse, open wooled and long legged, as so many of our sheep are, use a close wooled, heavy shearing, short legged ram. I know of nothing better for this class of sheep than a Merino ram, and rest assured that a reasonable amount of wrinkles and oil will be an advantage. There is no ram that we can use with this kind of a flock to the advantage that we can a Merino, as he greatly increases the quality and weight of wool or fleece and hardiness of his get without materially decreasing the size.

For a flock of common grade Merino and other small ewes, use a Cotswold, Shropshire, or some other large and equally good ram. I have used both Cotswold and Shropshire rams with my flock, to good advantage. I think the Shropshire the better one on account of his early maturity and hardiness, and the great vigor of the lambs, the lambs being less trouble than any others that I have ever handled. The only point in which the Shropshire is lacking is in the weight of fleece.

After the first cross, what then? It is admitted by all that this first cross makes a good sheep, but it is claimed that we can't go any further, or at most, can't better the first cross. This I think is a very great mistake. We can certainly establish a breed here suited to our wants, as well as they can in England and other countries. In fact we are unconsciously tending in this direction. We have made great improvements in the last ten years. Ten years ago it was thought to be an extra lot of sheep that would weigh on an average one hundred pounds; now we have them to average one hundred and twenty-five to one hundred and fifty pounds and sometimes even more, and shear eight to twelve pounds instead of from three to five. But some of this improvement in size has been at the sacrifice of hardiness, a point the common farmer must keep in view if he would make wool growing profitable.

We ought to establish as uniform a type as possible, both in wool and carcass, in order to get the best prices for our products. This can be done by careful selection, and by having the type of the "*coming*" sheep in view, and working in unison to that type through our organization.

The question is often asked, "will it do to use cross-bred rams?" I answer unhesitatingly that it *will*, and that it is the only way the "common farmer's" sheep can be produced. It was by this means the best breeds of England were produced, even to the noted Cotswold, as we now have it.

We have seen the very best results from cross-breeding horses and other domestic animals; why not with sheep? Partly because no one has given this subject sufficient trial and study in this county.

If cross-breeding has been successful in other countries, and with other breeds of domestic animals, why not with our sheep? when it is admitted by all that are informed that there is no class of domestic animals that we can manipulate more after our own will than sheep, if intelligently applied. The cross-bred sheep in England are classed as the farmers' and rent paying sheep.

The common farmers as a rule ought to keep a small flock, and keep them well, for if we would make the raising of sheep profitable, we must breed carefully, feed carefully, and keep carefully, and never breed from a ram that is inferior or of unknown breeding, even though you can save several dollars in the purchase price, for what will a few dollars amount to in the value of the lambs.

In conclusion, I would say, that the most profitable as coming sheep, considering size and keep, will be one combining the good points of all our best breeds; one having a close compact fleece, of medium wool, well covering the head, neck, legs and belly, with short legs and moderately long, square, heavy body; one that will fatten readily and mature early, *and let not the Merino, Cotswold, Shropshire and other breeders* say that the blood of their *animals* is too precious to be wasted in helping to establish or produce this most profitable or coming sheep.

Cal. F. Darnell, then read a scale of points used at St. Louis and Illinois fairs, which were referred to a committee and reported that they be adopted by this association which was carried, and the Secretary instructed to have three to five hundred printed, according to cost.

Committee—Darnell, Thompson and Privett.

The following resolution was passed unanimously:

Resolved, That we heartily approve the dog law given by our last Legislature and that we will do all in our power to enforce it.

A very interesting paper was read by T. W. W. Sunman, prepared by T. S. Cooper, Esq., of Ohio, on the "Characteristics of the Oxfordshire-Down sheep."

I. J. Farquhar offered the following resolution, which was passed by a hearty unanimous vote:

Resolved, That we extend a vote of thanks to Alex. Heron, Secretary State Board of Agriculture, for courtesies extended during this session of our association.

W. W. Thrasher offered the following, also, which was passed by a rising vote:

Resolved, That we tender a vote of thanks to our State Librarian, Mrs. Capt. Winsor, for a beautiful bouquet presented by her to ornament the President's table, both for this Association and the Cattle Breeders' Meeting, which adjourned yesterday, 12:00 M, and signed by J. W. Robe, President of Short Horn Breeders' Association, and F. Beeler, President of Wool Growers' Association.

W. W. Thrasher was appointed as a Committee to so report to Librarian.

Bill for printing and postage was allowed to J. W. Robe, of $3.

Association then adjourned to meet January 5, 1882.

MEMBERS OF THE INDIANA WOOL GROWERS' ASSOCIATION.

Name.	Postoffice.	County.
HON. F. BEELER	Indianapolis	Marion.
HON. H. C. MEREDITH	Cambridge City	Wayne.
S. W. DUNGAN	Franklin	Johnson.
THOMAS W. W. SUNMAN	Spades' Station	Ripley.
J. P. FORSYTHE	Forsythe's Dale	Johnson.
H. N. ENSMINGER	Danville	Hendricks.
D. H. THOMPSON	Waldron	Shelby.
M. C. ENSMINGER	Danville	Hendricks.
JACOB KENEDY	Lizton	Hendricks.
JAMES MUSTARD	Broad Ripple	Marion.
C. W. MOFFIT.	Nora.	Marion.
H. A. HAVERSTICK	Nora.	Marion.
A. S. GILMORE	Greensburg	Decatur.
HON. ROBERT MITCHELL	Princeton.	Gibson.
CAPT. C. B. JACKSON	Centerville	Wayne.
E. L. GUTHERIE.	Adams	Decatur.
WM. NIGHT.	Waldron	Shelby.
URIAH PRIVETT	Greensburg	Decatur.
WM. R. RIDGEWAY	New Holland	Wabash.
THOMAS WILHOIT	Middletown.	Henry.
JOHN L. HENSHAW	Carmel	Hamilton.
B. F. MAGEE	Montmorency	Tippecanoe.
HON. LEE MCDANIELS	Rushville.	Rush.
HON. WM. A. BANKS	Door Village	Laporte.
B. F. GING	Starr.	Rush.
JAMES M. WYNN	Scipio	Jennings.
HON. S. R. QUICK	Columbus	Bartholomew.
HON. W. W. THRASHER	Groves	Rush.
J. A. JOHNSON	Green Hill	Warren.

J. W. Robe	Greencastle	Putnam.
Alfred Hadley	Center Valley	Hendricks.
Albert Marlatt	Milton	Wayne.
Hon. Cyrus T. Nixon	Indianapolis	Marion.
D. C. Hayworth	Clayton	Hendricks.
W. A. Glover	Clayton	Hendricks.
J. L. Thompson	Arcana	Grant.
S. Dinsmore	Bloomington	Monroe.
Oakley Purcell	Nora	Marion.
C. F. Darnell	Indianapolis	Marion.
N. D. Gaddy	Lovette	Jennings.
A. N. Hanna	Indianapolis	Marion.
A. McClelland	Door Village	Laporte.
E. J. Howland	Indianapolis	Marion.
L. T. Harding	Laporte	Laporte.
Thomas Hughes	Hebron	Porter.
M. M. Pierson	Greenwood	Johnson.
Jacob Farquhar	Trenton	Randolph.
I. J. Farquhar	Trenton	Randolph.
Wm. Crim	Anderson	Madison.
William Baker	North Madison	Jefferson.
W. J. Scarce	Danville	Hendricks.
Geo. W. Robinson	Guilford	Dearborn.
Thomas Nelson	Bloomingdale	Parke.
Greensbery Dobinspeck	Nora	Marion.
J. Q. Prig	Middletown	Henry.
S. H. Moffitt	Mattsville	Hamilton.
Wm. Smock	Acton	Marion.
J. N. Woodruff	Ninevah	Johnson.
Dr. A. C. Stevenson	Indianapolis	Marion.
L. S. Fitch	Oakwood	Laporte.
W. L. Schooley	Arcana	Grant.
Ira T. Gregg	Greenwood	Johnson.
Jonathan Conkle	Castleton	Marion.
C. M. Riggins	Lebanon	Boone.
J. R. Tomlinson	Fairland	Shelby.
J. W. Clark	Arlington	Rush.
I. N. Cotton	Trader's Point	Marion.
Hon. C. A. Howland	Indianapolis	Marion.
E. Butterfield	Wright's Corner	Dearborn.
J. H. Swail	Logan	Dearborn.
Jonathan W. Yoke	Bloomfield	Greene.
Ed. H. Crow	Greencastle	Putnam.
Shepler Fry	Acton	Marion.

F. Beeler, President.

J. W. Robe, Secretary.

PROCEEDINGS OF JANUARY MEETING, 1881.

ROOMS OF STATE BOARD OF AGRICULTURE,
INDIANAPOLIS, Wednesday, Jan. 4, 1881.

The annual meeting of the wool growers of Indiana was held in accordance with the programme.

President Fielding Beeler in the chair, and J. W. Robe, of Putman county, Secretary. The regular reports were read and referred, and the association listened to and discussed the following papers: "How to Castrate and Dock Successfully," Mr. Clark, Rush county. "What Course shall we Pursue to Increase the Number and Quality of the Sheep of Indiana?" C. F. Darnell, city. "What is Tariff, and What has it Done for Sheep Husbandry?" J. W. Robe, Greencastle. "Sugar Beets, Mangel Wurzels, Rutabagas, Carrots and Parsneps in Relation to Sheep Husbandry," T. W. W. Sunman, Spades, Ind.

The following officers were elected for the ensuing year: President, Fielding Beeler, Indianapolis; Vice-President, R. J. Farquhar, Trenton; Secretary, J. W. Robe, Greencastle; Treasurer, S. W. Dungan, Franklin.

SHEEP AND WOOL IN INDIANA.

BY CALVIN F. DARNELL.

What course shall we pursue to increase the number and quality of sheep in Indiana?

The keeping of flocks and herds was among the earliest occupations of the race, and it still continues to be a favorite occupation in all the less densely populated regions of the globe. Where population becomes dense, as in China and Japan, herds of cattle disappear, but flocks of sheep, except in cities, maintain their ground almost everywhere. The sheep in some one of its several species was originally found in a wild state on all the continents, and was easily domesticated everywhere. The sheep in its native state inhabits mountain regions or dry elevated plains, and lives on the scanty herbage of such localities, but it is very flexible in its characteristics, and varieties have, by long breeding, been produced that delight in rich valleys and luxuriant vegetation; but even the Leicester and Dishley breeds, which belong to the lowland races, feed on weeds and herbage that cattle refuse to eat. To increase the number of sheep in our State, it is necessary to demonstrate that sheep husbandry is profitable. This has been done in a kind of general way. But men who propose to invest capital in a business demand something more definite and specific. Let any person take a small flock, say ten good, healthy ewes and one good buck at shearing time, for sheep are generally the cheapest then, and pasture them on a piece of ground just sufficient to keep them well through the summer, and keep a careful account of their winter food; then take the original value of the sheep and add to it the value of the pasture, and the interest on this sum, together with the value of the food consumed and the labor in feeding, shearing, etc., will give cost; against this, set down the value of wool sold and lambs raised, and their value, and thus determine specifically the profit of sheep husbandry in Indiana. By this method we can increase our flocks from year to year and know our exact profit. It is incumbent on us that we remove a prejudice against Indiana as being a State not well adapted to sheep raising. It is true that in the early settlement of Indiana, north of the Ohio river hills, the dense forest and undrained marshes were unfavorable to wool growing. But all is changed now; the forests have been cleared away, and tile drainage has made the greater portion of Indiana as dry as most hilly countries are. It is safe to say that at the present time the health of sheep in this State is fully up to the average of the United States. It is proper to say, however, that the long wool, lowland breeds, such as the Cotswold, Leicester, etc., will be better adapted to our rich plains than are the mountain races of sheep, such as the Spanish Merino, etc.

Experience has proven that by crossing the several European stocks we are able to produce a native variety entirely adapted to our country and climate, both healthy and long lived. But it will not be sufficient to make satisfactory proof that wool growing is a profitable business in general terms, and that Indiana produces healthy sheep and good wool, unless we can give some assurance that our expensive flocks of fine sheep will not go to the dogs. Prudent men will invest in the business cautiously, and it will be difficult to materially increase the number of sheep in Indiana. It is too early to predict the effect of the dog law passed by the last legislature, but we indulge a hope that it will operate to diminish the number of dogs in the State, and if it does it will increase in due time the number of sheep in the same ratio. Quality of sheep may relate to their value as food or as wool producers. While mutton is as nutritious and more easily digested than either beef or pork, yet it generally sells at lower figures than any other market meat. The black faced or Yorkshire breeds are much esteemed for food. They are large, clean limbed, hardy and goat like in their habit; but the wool, though abundant, is coarse and almost worthless. A cross of this stock, with the Exmoor and fine wooled Spanish breeds, gives us the Southdown, which retains the fine wool of one parent and the finely flavored mutton of the other. We have a native variety; perhaps a species of sheep found wild in the Rocky mountains whose flesh is reported to be of excellent flavor. Whether the big horn of the west will cross with our domestic sheep, and what would be the character of such a cross are questions worthy the attention of our sheep growers. But the chief object of sheep husbandry in this country is the protection of wool. If the fleece of the Cotswold, and other long wooled breeds of sheep, can maintain a price in the market equal to other grades of wool, its production would be good economy on account of the greater weight of the fleece. But this grade is adapted only to the production of worsted goods, and is used in manufacturing but to a limited extent. The experience of the last year in prices suggests the wisdom of producing an intermediate grade by crossing the long-wooled breeds on fine-wooled Saxon or Spanish stock. By this means it might be possible to make the long wool short enough to be manufactured by carding and yet susceptible of being combed for worsted goods. It is only by judicious crossing that we can hope to materially improve the quality of our wool.

The duty on foreign wool sustains an important relation to the subject assigned me, but as this is made the subject assigned another party, I decline its discussion any further.

Mr. J. L. Thompson. The gentleman spoke of the long wools the Cotswolds and Leicester breeds being better adapted to the rich soils. I judge the gentleman is right in that, I think where we have a luxuriant growth of grass as we have in this State on our low lands, after they have been underdrained, probably the larger varieties of sheep would be more profitable. I don't know that it would be confined to the Cotswolds especially, I think the Downs would do possibly as well or better. Our Shropshires are well adapted to this luxuriant growth of grass. I would not argue that the Merinos are better adapted to that kind of surroundings than the larger breeds of sheep, I do think though that Merinos, where they have been kept in large flocks on a sparser growth of grass, are better adapted to them than any other; I think there can be no mistake about that. They require less care, less looking after than any other breed of sheep that I have had any acquaintance with. They keep down weeds and briars and sprouts to better advantage than some others. That is of some importance in our State. I will admit after it is in a high state of cultivation that we will hope to reach hereafter, it will not be necessary to have that kind of sheep. At the same time they have a profitable yield of wool; more wool to their weight of carcass than any other breed, though they may not be worth quite so much for mutton.

Prof. S. W. Dungan. This subject is one of vital importance to every wool grower of Indiana. Many millions of pounds of wool are imported annually into our country that we should supply from the farms of Indiana. We can not expect to successfully increase the number of sheep by raising an inferior quality of sheep. We want in the first place, the very best breeding rams we can secure. If a man commences the business of sheep husbandry and neglects his flocks, it is no encouragement to his neighbors to embark in this business; if he keeps his flocks as he should, and studies as he should in regard to sheep husbandry, there is no question but what his neighbors will see that he is successful and they will embark in the business. A great many persons become discouraged owing to a temporary depression in the wool market; or if some flocks here and there are infected with disease they conclude that sheep husbandry is not a paying business and they abandon it. In regard to the different breeds that are adapted to the soils of Indiana we all have our opinions. We all know that low or marshy lands are not adapted to any breed of sheep, any flock will soon become infected with disease. I would not advise any man who has that kind of land to embark in the business; but I do say that any land that is dry is just as well adapted to the raising of sheep as any other stock. Dry land is the first important requisite.

Dr. Stevenson. I once raised some sheep. I will speak about dogs killing Merino sheep first. I was lucky enough to have seventy-three killed in one night. I heard of one remedy that struck me forcibly as being effectual. I was told by an old backwoodsman that hunted for a living, to turn the sheep into a barren field, and get them just as full of burrs as they could stick, and, says he, the dogs won't kill them. (Laughter.)

My friend, Mr. Dungan, is right in saying we should select the best breeds of sheep, but he left one thing out, which was to tell us what is the best breed.

Mr. Dungan. That is dangerous ground.

Dr. Stevenson. Still I don't know that a man should run from danger always. One great trouble is, that sensible men are sometimes afraid to speak their opinion, and they keep still and let the foolish people do the talking and carry the day. I think there is nothing necessary to do to increase the number of sheep, but to decrease the number of dogs. When I raised sheep, I made it a rule to kill all the dogs I could. I used to say to my neighbors, I could not pasture their dogs and if the dogs came on to the pasture, I must kill them. If a dog was killed by anybody else, I told them to just lay it on to me. I had a boy that killed nine dogs in ten nights with a spring pole right at my door.

I learned the habits of the dogs. I knew where the dogs would come across the fence into my pasture field. They will hardly ever travel through the woods if they can get a path. You will find that out by going out such a morning as this when there is snow upon the ground. There I bated them, and there I destroyed them. When I found dogs killing my sheep, I never disturded them until I got on a horse, and when I got them started towards home, I kept in sight of them. I hardly ever failed to get them home; I drove them right to the door. Upon one occasion I borrowed my neighbor's hounds and put them upon three dogs that were killing my sheep; two of them we found at home, the third was gone before we got there. The owner said, "He is a worthless run-about dog, kill him if you can." That night he came back and killed ten more sheep. I set baits for him the next night, and on the following morning I found the baits gone, and there was the big white dog. People love their dogs. I followed once a small fiste right to the door and spoke to the lady about killing it. "Why," says she, "I brought that dog from Cincinnati with me, the pretty little thing could not kill a chicken." And she would not let it be killed. If you increase the number of sheep in the country, you have got to get the dogs out of the way.

Sheep are raised for only two purposes in this country, for mutton and for wool. If we can raise sheep that will make a good quality of wool, and make as fine mutton, then we have gained a very important thing. Wool can not be dispensed with. These gentlemen here are dressed in wool. There is wool in that coat, in that vest, in these pants, in the underclothes, an immense amount of wool must be raised. It must be had either at home or abroad. We have not been at it a great many years, but we are sending sheep to England. Mutton is shipped in the carcass in large amounts. It is a source of revenue to the country it is a profitable business. If we can raise sheep that the carcass can go to England, or go to our large cities, or manufacturing towns, or districts to feed men that are engaged in other business than farming, and, at the same time, raise wool that will clothe the whole population of the country, then we have a breed of sheep that is better than any breed that will produce but one article—either wool or mutton. When I was in the sheep business, I raised nothing but the Merinos, I never could sell the wethers for mutton, they were small and never looked fat, when they were in pretty good order—they did not fill the eye of a butcher. The buyer of sheep who is going to ship them, wants a large, plump sheep, straight back, good ribs, and that will show it, and when he is slaughtered will cut well, that is tender and juicy. At this time with a great number of breeds of sheep filling almost every purpose that you can immagine for wool and for mutton, combined and separated, I think it would be easier to take some known breed. Look at your Cotswold, Southdowns and Merinos and all the various sub-varieties of these main leading varieties, and make your best selection, the selection that would suit you best, and breed that breed. It is better than to attempt to make a breed.

It is not an easy matter to make a breed, I once tried to do that thing on hogs. I found a great deal of trouble. I wanted a hog of a particular kind, and I bred to some extent to that kind. I bred the ears off of some, some of them would fall down, some of them would have but one ear, they would be weak in some parts, the result of breeding together in and in. It requires a great deal of skill and a great deal of time to make a breed. If I was young and could call back my lifetime, I should select from among the various breeds that we have that I thought would suit me best. In raising sheep for both purposes, for mutton and for wool, we have something that is ready for market every month in the year. The general purpose sheep is the best sheep. The gentleman has said something about the large breeds of sheep not doing well in large flocks. I have never tried them in very large flocks, but I have known highbred sheep to be kept in flocks of one hundred on a small piece of ground. I would suppose 500 might be kept on a piece of ground five times as large, it depends upon the size of the ground. Large sheep may eat more than small sheep; whether Cotswold will eat more than Merino or not I don't know, Merinos are pertty good eaters. They make a pretty good quality of wool, but to make the garments that are worn now, it does not require very fine wool to make them. When I was in the sheep business there was a great demand for Merino wool, I have sold it for seventy cents a pound; but there is not that demand now that there was for a wool of very fine fiber.

Mr. Banks. I believe I have nothing particular to say in regard to the matter. I find over our part of the State, I don't know whether it is unusual or not, we have very hard work in disposing of our long wool, what we call our combing wool. This year all the offer I could get for mine, was sixteen cents a pound. Whether our factories are not prepared to use it I don't know. I can sell my fine wool a little better than my long wool. Middle wool or Downs brings a very fair price, and they are anxious to get hold of it. If you gentlemen can give me any light where there is a better chance to sell this long wool that is so profitable to raise, I would like to hear from you.

Mr. Dungan. I am surprised to hear the remarks made by my friend Banks in regard to the price of combing wool and the difficulty that he experienced in disposing of it. I mean unwashed wool. That is the wool, gentlemen, that I have grown for the past fifteen years, and I have invariably received the highest price for that wool. I don't understand why there should be a great difference now in different sections of the State. Our buyers in Franklin ship principally to the east, and they pay the highest price for combing wool. In fact I receive a higher price generally than any other man in our county. Brother Pearson and myself three years ago sold wool for three cents more on the pound—combing wool—than they were paying for other wool. I will say that there has been a change in the last two or three years in relation to that matter. I mean more particularly in the city of Indianapolis. I heard from persons who brought wool here that they rather prefer the middle and fine wools to the long wool. They have no machinery for manufacturing this combing wool, they send it to eastern looms. It is manufactured into a higher grade of cloth than they are able to manufacture here.

Mr. Beeler. I was surprised at my friend Banks' remarks, too, about the price of his long wool.

Mr. Banks. I have never sold it, but that is all the offer I can get for it. I have it yet on hands.

Mr. Beeler. I sold my wool this season for twenty-four cents. My sheep sheared twelve pounds per head in the dirt, which is I think, taking the flock through, pretty heavy. My sheep were in good condition.

Mr. Banks. I was offered twenty-five cents for my middle wool, twenty cents for my fine wool, and sixteen cents for my long wool. I do not know of a manufactory in the State that is prepared to manufacture this very long wool. I don't think there is one in the State. We have two manufactories in our town; we can not sell it to them.

I will just say in regard to the different breeds of sheep, that it is like almost everything else, some men are better adapted to some kinds of sheep than others, owing to the way they handle their stock. When men find they are successful with one breed of sheep and are doing well, I would not advise them to change for anything better. On the hilly lands of the State my own opinion is that the Merino sheep are preferable, while on the rich low lands the larger breeds would be preferable. For myself, I am very well satisfied that the large sheep are the most profitable sheep for me. Our part of the State has mostly the fine wool sheep or middle wool until within a very few years. But when you raise wool and can not sell it, it is very discouraging.

Mr. Robe. I have had a little experience. I begun breeding sheep about 1871. I bought five and I bred up until I got two hundred from that five. When I got to two hundred I introduced Cotswold bucks and I begun to get considerable tail. That has been three years ago; since that time I have been unable to increase my sheep. My rule is to sell my yearling wethers and keep my ewes and any tail, that is, my barren ewes that don't seem to be breeding, or when they get a little too old and look like they were going down, I put those off to themselves and sell them with my yearling wethers. I don't have as many of that kind to sell as I have increase of my flock. By tail I mean culls, the tail end of the flock. I have just determined I will introduce a cross because I want a greater flock. My land is scattered some; but I can not have my sheep on three or four different pastures. I want them to run together so that when I go to salt them I can do it all at once. I don't shelter my sheep; I am a careless shepherd, no doubt, about that. I want sheep to take care of themselves the same as my cattle. I don't want to have them all tails or all culls.

Mr. Dungan. We have discussed this subject frequently; every man has his favorites and whether it is profitable to the members of the association, I doubt. My friend here acknowledges that he is a very careless flock master. He says that he expects his sheep to take care of themselves just like his steers. When a man treats his sheep in that way he can not expect to have any success.

If we are successful with any kind of sheep we must take care of them. He must be in his flock every day. He should have his fields arranged so that if he has two hundred sheep he can have them divided into some four or five different flocks. We can not be successful until we do give attention to these things. I am surprised at my friends talking the way they do in regard to the Cotswold sheep, when they are certainly acknowledged by all sheep writers, by men who have given this subject their attention all their lives, to be the hardiest sheep in existence. I have a flock of two hundred and fifty head of Cotswold sheep, they are arranged in different fields. I see to those sheep. I see that they have pure water and shelter when it is necessary. I see that they have good nutritive food. When I hear remarks that are made here by members that they want something that will take care of themselves, it looks like they are lazy, they don't care about seeing after their stock.

So far as Cotswold sheep are concerned I take, as I think, a sensible view of the matter and that is that it is a general purpose sheep. We all want the general purpose horse because he can plow, he can go to the carriage or anywhere. He is not like the Clydesdale or draft horse, only fit for draft purposes, nor the light harness horse, he is only fit for light harness; but the general purpose horse we can use for anything. Just so it is with the Cotswold sheep. He furnishes a fine supply of wool, and we can get a carcass that will weigh at least from two hundred to two hundred and fifty pounds. They do not ask us when we bring our sheep to market whether they are Cotswolds, or Southdowns, or Shropshires, they pay us the same price for our grand, majestic Cotswold that they do for the Southdown or the Shropshire.

Mr. Clark. It can not be insinuated that I am a careless shepherd. I have always provided shelter for my sheep when they needed it. Now, one year, from thirty-eight Cotswold ewes I raised fifty-three lambs, this last year when so many have been unsuccessful, from sixty-five ewes I raised seventy-three lambs.

Mr. Dungan. If we have the Cotswold we get a large carcass, we get a large supply of wool, both of which is valuable, and we get as many lambs from Cotswold ewes as it is possible from any other ewes except the Southdown, possibly the Southdowns are more prolific. Then we have the wool and mutton both together in one sheep. Is there any other sheep that walks that we can get the same profit from that we can from this sheep? I answer positively, no. I have no objection to the Merino. I am glad my friend Thompson and other men in the State are raising Merino sheep. I am glad they are raising Shropshire and Southdown, but we want all these varieties. But it will not do, gentlemen, for us to get up and discard every other breed of sheep but the one we have a particular fancy for. It is positively injurious to the interests of our Association for us to do this. A sheep is an animal I love, whether it is long wool or short wool. It is an animal, the breeding of which we should encourage. I am free to acknowledge that it will not do for too large a number of Cotswolds to run together. I can not see the necessity of allowing so many of them to go together. We farmers have our farms fenced into lots of ten, twenty, thirty, forty or fifty acres. Why is it necessary for us to keep so many in one flock, when it is such an easy matter for us to divide our flocks? In this way we can be as successful as we are with any other breed of sheep. In regard to them being more subject to disease, this certainly must be a mistake. The Merinos are more subject to the foot-rot. We scarcely ever hear of a Cotswold being infected with the foot-rot, but the Merinos are very subject to it. They are also more subject to the scab than the Cotswold sheep.

Mr. Forsyth. I have got seventy head of pretty fair quality of grade sheep. I use them for grubbers. I want to grade them up. I want to get a good buck—some of the Downs, or whatever I think best to cross on them for the particular purpose I want. You want to take care of your sheep. Here are men that have got from forty to a hundred head of sheep. There are such men scattered all over Indiana. Now, the way for them to increase the value of the wool and mutton is for them to select the best cross that they can get to cross on that sheep and go ahead. There is no man that can afford to go out and buy one hundred thoroughbred Cotswold sheep, and start in that way. They will lose money. There are men that raise forty or fifty sheep and that take especial care of them, as my friend Dungan or Darnell. They raise the sheep for breeders and sell them for breeders. We know where to go and get them, and we cross them on our common sheep, and in that way we increase the amount of wool and mutton in Indiana. We ought to earnestly support this thing of protective tariff to protect the wool growers of this nation.

Mr. Calvin Darnell. I hardly know what to say, as some have said just exactly what I wanted to say. I don't know whether I had the paper to the point or not, but that was my judgment. I wanted your opinion on it. I did not recommend Cotswould sheep, I did not recommend the Merino, I recommended the cross to get the mutton and the wool. Col. Parker, no longer than last Wednesday, laughed at the idea of going to Canada and bringing such expensive sheep here. Last week Col. Parker took a car load of sheep to Buffalo, N. Y., to sell them. He said when he got there he found out he had got the wrong sheep entirely. He had scrub sheep, the tail that these gentlemen speak of. He said grade Cotswolds sold for $12 a head, while he could not sell at all. Allow no man to come to your flock and select the best, leaving the tails. I am like Mr. Dungan, I would not recommend over a hundred Cotswolds to be herded together, they will scatter a little more than other sheep. I believe we give the sheep too much scope. Take a ten acre lot and lay it off into four lots of two and one-half acres each, turn them onto one lot one one week and onto another lot the next week, and so on. We make a mistake in turning our sheep out on the range and don't see them hardly for a week. We want to house our sheep in stormy nights. They are not like a hog, they will freeze to death. I do not say for every man to raise fine sheep, Merinos or any other breed, but somebody has got to raise them.

Allow me to read a few remarks upon advice to sheep breeders, in an address by President Ball, of the Michigan Wool Growers' meeting:

"Twenty men in every township where there is one should engage in breeding thoroughbred sheep, either Merinos or Longwools. Parties from the West will stop in Michigan for their purchases as soon as they can obtain their supplies. At present our home demand is almost entirely supplied by importations from Vermont and Canada, and yet it is not fully supplied. It costs no more to raise sheep that will shear from ten to twenty pounds and will sell from $20 to $100, than one shearing from five to seven pounds of wool, and bringing two or three dollars per head. I say this knowing the fact that a great many believe that the market will soon be over-supplied and prices go down. The facts are against the theory. One thing is certain, no man has a right to raise a poor bred, half starved animal of any kind, if he does, the animal so raised will see to it that his owner is the loser in the trasaction. Land is too dear in this country already to breed and rear animals that are inferior.

"One principle should always be observed, to keep well whatever you raise. No animal should go through the winter and weigh less in the spring than when it went into winter quarters. No sheep, for the want of a little extra care, should shear five or six pounds of wool at shearing, when, with that little extra care, it would have sheared several pounds more, yielding its owner a good revenue above the extra cost in food and care, besides being a delight to its owner. For breeding purposes always select the best, fatten the poor ones, and send them to the butcher. Keep less if you are in the habit of keeping too many, and keep better ones. Be happy where you have been miserable. Take pride in your stock and your stock will appreciate it in more than one way. It will pay."

Mr. Colton. This appears to me a very broad field, the idea of increasing both the number and the quality of our sheep. If we discussed all questions bearing on that subject we might remain here all day. One of the first things of importance is to go back to the time we mate our buck with the ewe. We have got to have her in good condition. With my farm, I think, I can raise Cotswolds best and cross them. If some other man thinks he can raise Merinos best, let him do it; and the same with the man that thinks he can raise Shropshires best. It has been my observation that every man succeeds best with that which his mind takes hold and runs after.

Mr. Thompson. The idea is here on paper, that the Cotswold do not do well, and the Merino has the foot rot. If we would all come up here and tell the truth and rigidly examine our breeds of sheep could tell where they fail. I can tell where the Shropshires fail, and the Merinos fail, and this man can tell where the Cotswold fail. If we would do that and do it rigidly and honestly, it would be a great aid. In the first place, I think my friend Dungan struck the key note, when he said the way to increase our flocks, was for every one to do the very best he can do, and in that way he encourages his neighbor. I will say that I think I have done as much as any man in my neighborhood to improve the sheep. A few years ago my neighbors quit the business, sold out all they had. I took tolerable good care of mine and my success encouraged them. There are men here now that have gone into the sheep business through my influence and are making a success of it. Some people make a mistake in keeping their sheep too high. Some six or seven years ago we got some Shropshire sheep here at the State fair. They were in very high condition. I have made a success of it. Some of my neighbors bought some of the same kind of sheep, I can't say exactly so much for them, for they have not done well at all. The Shropshire lacks in weight of fleece. I do not think he lacks in quality and amount of mutton. His wool gets matted up a little too much. I think he takes that from the Southdowns. When they are kept at their highest point I know of no sheep that will do better. This last fall I visited Mr. Allen's flock of Illinois, I found them in better condition than I expected; but still the lambs were not in a healthy condition like all others. Even the Cotswolds that have been spoken of here, he had a cull end.

There were quite a number of culls among our Shropshires at home. With the Merinos we have culls—but I notice this, that with any Merino cull you can keep it over and it makes a good sheep.

A writer in the Live Stock Journal made the remark that the sheep that clothes the million must feed the million. The mutton qualities of the Merino can be greatly improved. I saw ten Merino wethers in Chicago that averaged one hundred and thirty odd pounds in weight, the fleece was lying there, eighteen pounds. They were certainly as profitable as any Cotswold sheep that are raised for mutton and wool together. But for a general purpose sheep, and that is certainly what we want in Indiana, I think I have got the best results by cross-breeding. I bred a good Cotswold buck to all my Merino ewes. That improved them wonderfully, both in mutton and shearing qualities. The wool is worth more on those half bloods than either of the full bloods at present prices. I bred this cross-breed to the Shropshire rams. I think that is a wonderful improvement. It helps the Shropshire. The general farmer is not able to buy the Shropshire, and is not able to buy the Cotswold or any other thoroughbred sheep of the best quality that cost from $25 to $100 for ewes; but he can buy these common sheep of the country and by using the very best rams he can greatly improve them. But you can not always make them think they can afford to buy a thoroughbred buck.

I do think on an acre of blue grass pasture a man can keep five sheep. I think that can be done very readily, but it certainly would be the heighth of folly to put five hundred sheep on one hundred acres. They would tramp the life out of the pasture. It would certainly be a failure, and the droppings would be likely to affect the flock with disease where there were so many.

There is a certain class of clothing that requires this very fine wool. There is not near enough of that to supply the demand. All those heavy shearing, oily fleeces makes the very best clothing wool. Eighty per cent. of all the goods of the country are made out of that class of wool. We do not supply it entirely. We get that class of wool from Australia, and from some other points.

I do not want to see farmers undertake the breeding of thoroughbred flocks. It is right for brothers Dungan and Darnell to breed their thoroughbred flocks, for they are better able to take care of them, but for the common farmer it is out of his reach, and as a general thing he is not successful with these high kept and high priced sheep. He makes an utter failure of them.

By keeping sheep I have been able to add a few acres each year to my pasture. We move the fence out and mow the briers down once, and the sheep keep them down. I have got a Cotswold cull. His head is down and his tail is down, and his back up, and I utterly fail to ever make a sheep out of him under any circumstances. But a Merino, you get him very narrow, and contracted all to pieces apparently, and you can make a passably good sheep out of him.

Mr. Forsyth. Will the profit pay you for the trouble and expense in bringing him up?

Mr. Thompson. Yes sir it will, but it would not for the other.

Don't understand me, gentlemen, that I want to hit any breed of sheep. I have bred several of the breeds, and I think pretty well of all. I do not want to slur any breed of sheep. We are brothers together, and we ought to fight this matter on a common level, and not let anything go out against our business.

Mr. Dungan. I must say I admire the spirit of my friend Thompson very much. We should encourage the breeding of the several varieties of sheep. I want every man to raise that breed that suits him. The main thing is to develop and cultivate each breed to the highest degree of perfection. It should be the ambition of every wool grower of Indiana to accomplish this thing. If we can not be successful with this particular breed, perhaps our immediate neighbors or friends in the remote parts of the State have been successful with them. We meet here for our mutual good, our mutual benefit. I find the changing from one piece of ground to another does my sheep a great deal of good. I never allow my sheep to run over a week on one pasture in the summer time. I give them plenty of good water and good shade. I abhor nothing more than for my sheep to lay in the hot sun without any shade trees. It is worse for them than being without shelter in the winter time.

Mr. Cotton. I prefer to leave my sheep out in the winter time in rough weather than to allow them to be in the hot sun in the summer time.

Upon motion of Mr. Robe a committe of four, consisting Mr. Robe, Thompson, Farquhar and Cotton were appointed a committee on programme for next meeting.

The association then took a recess.

The meeting was called to order by the President. Then convention listened to a paper on

WHAT IS TARIFF, AND WHAT HAS IT DONE FOR SHEEP HUSBANDRY?

BY J. W. ROBE, OF PUTNAM COUNTY.

In the United States the term tariff is used to designate the schedule of duties fixed by Congress on imported goods.

The adoption of the first tariff law is coeval with our constitution, and stands as the second act recorded in our statute books bearing the illustrious signature of George Washington, which laid the corner-stone of our whole system; and, it was then proclaimed to the American people, and to the world, that it was necessary for the encouragement and protection of our manufactures, that duties should be laid.

This great system, which is now rapidly paying off our national debt, was then established by the fathers of our constitution, with the father of his country at their head; and may God forbid that the American people should ever be so rash as to abolish or cripple this great source of income to our government and protection to our home industries.

It is not a "local" question, as we once heard, but a national question of profound interest to every citizen, for there is no dweller in the humblest cottage on our remotest frontier, who has not a deep interest in the legislation upon this great national system. While it has long been a political question, and subjected to many changes since its first inauguration, and at times been run to extremes of high and low tariff, it has been more than demonstrated that a tariff occupying medium grounds is the best possible revenue tariff, and the best protection to people and manufactures that we can possibly have.

The Morrill tariff, for so it is called, became a law March 2, 1861, and has generally been regarded as occupying this medium ground between the protectionist and the free trader; and, of course, the extremest has never been entirely satisfied with it; but the people, who look at results rather than at theories, have so far resisted any very material changes. Though a few modifications have been made from time to time, yet substantially it remains the same.

Now, let it be remembered, that about twenty-five per cent. of all the laboring people of this country are artisans, who are engaged in manufacturing products essential to the well-being of our country; and it is these arts that causes our country to rise above the ordinary drudgery of "drawers of water" and "hewers of wood," and places our nation higher in the scale of civilization, bringing blessings to all alike; and all patriotic citizens will cheerfully bear a fair share of the burdens necessary to make their country great and self-sustaining.

Free trade is very pretty in theory, but that is all there is in it, for it utterly fails when put into practice, and I venture to say no greater fallacy was ever put forward to deceive and mislead any people than the free trade theory. Much of the mystification and confusion that we find in connection with the question of protection grows out of these theories, which are laid down in political economy, but fail when put to the test; and why experiment again and again with a theory that has many times proved a miserable failure. England has now what she is pleased to call free trade, and during the last decade her export trade has decreased fourteen per cent., and ours, under our present tariff, has increased one hundred and thirty-five per cent., giving the balance of trade in our favor of $264,661,666. We have advanced and she has gone back, we have increased and she has decreased, and to-day we are competing with her in the markets of the world with almost all kinds of manufactured commodities.

There is no country in the world where the laboring classes are paid so well for their labor, and where, as a consequence, they dress and live so comfortably, and are so intelligent, as in the United States.

Protection to our manufactories gives labor a greater field for production, and of course, higher wages. Suppose you throw out of employment three or four million artisans, they must seek other employment, and that other employment must over produce, and the capital invested and the operatives must suffer to that extent; and thus, if a few million artisans should cease to be consumers and become producers of food, how then? Food would be a drug in the market, and farmers would raise debt for their biggest crop, and soon have their houses shingled with mortgage bonds. England could not take our surplus, for last year her harvests were unusually deficient, and we supplied all her wants, and our elevators were still bursting with grain. England would prosper, no doubt; she would buy what she wanted of our food at the price she might choose to give, and sell us her goods at the price she might choose to demand. Home market is certain, constant, and reliable; foreign depends on foreign harvests.

History furnishes no example of a nation adopting the free trade policy, neglecting her own national industries, and depending upon the industries and skill of other countries, for the supply of their necessities, that did not finally become dependent and tributary. As well might England try to convince true Americans that bread is destructive to human life, or that the genial sunshine and refreshing showers of spring are detrimental to the vegetable kingdom, as to try to persuade us to adopt free trade principles for her own pure, unadulterated selfishness.

Our present tariff, in point of revenue and of protection to manufacturers, has proven a complete success. Under our present rate of duty, our yearly average of revenue has been, for twenty years, $172,000,000, which shows a very healthy condition of our commercial relations. It has produced, from textile fabrics alone, more revenue than we ever raised from all sources, under any other tariff enactment, and it has not interfered in the least with our export trade, as it never was so large, nor the balance of trade ever so great in our favor.

WHAT HAS TARIFF DONE FOR SHEEP HUSBANDRY?

Upon the whole, no part of our tariff system has been more amply vindicated by experience than that portion which relates to wools and woolen goods, the foundation of which was laid in 1861; but in 1867 the existing rates were more perfectly established, and that after a long and exhaustive investigation and with the concurrence of both the producer and the manufacturer. It was the result of an adjustment between the two interests, the wool grower and the manufacurer, which had theretofore been in opposition. And the result of their deliberations has, in my opinion, given us the wisest arrangement of a protective tariff on wools that could have been devised, as experience has abundantly proven.

The present duty on foreign wools is 10 cents per pound and 11 per cent. *ad valorem*, varying according to class and quality. The basis of this legislation was, that upon imported wool a duty should be imposed sufficient to promote the growth of sheep husbandry, and a specific duty was also imposed on woolen goods, as near as possible equal to the duty put upon the wool which entered into the manufactured article. This was not intended for protection, but simply an equivalent duty, which placed the woolen manufacturer on the free trade level.

To this specific duty was then added a duty of 35 per cent. *ad valorem* on woolen goods as a protection to the manufacturer against foreign competition. This adjustment of the law has remained substantially unchanged since March 3, 1867.

HOW HAS IT AFFECTED SHEEP HUSBANDRY?

There are now about 400,000 wool growers in the United States, all intelligent farmers, who have come to realize that without a protective tariff their industry must die.

"This magnificent army of protectionists is not confined to any one State or section of the country."

Growers of wool plant their industry in every State and county of the land, from Maine to California, and from the Gulf of Mexico to the great lakes; there is not a foot of soil in our vast domain that is exhausted by cultivation but that may be enriched by the sheep herd, and then call forth its earnest advocates for protection.

Other industries are largely local, but this one is general, grandly growing to be universal under protective principles.

The 41,000,000 sheep that supply us with cheap animal food contribute 250,000,000 pounds of wool per annum to clothe our people, and that find their sustenance upon our land, and leave the soil richer than when they came, are doing a wonderful work in educating and making us independent and self-sustaining, and it is to be sincerely hoped that they will increase much more rapidly in the next score than they have in the last.

In 1836 the wool product of the United States was estimated at 42,000,000 pounds per annum. In 1860, according to the census, it had risen to 60,000,000 pounds. Under the Morrill tariff the product has risen, in 1881, to over 250,000,000 pounds per annum. In the twenty-four years preceding the war our wool product had increased but 40 per cent., while the present annual product is about 400 per cent. greater than that of twenty years ago. This wonderful increase in quantity has been reached without nearly doubling the number of sheep; that is to say, the assurance of permanency and security for capital that was assured by the tariff enactment encouraged enterprise and skill into doubling the average amount of wool taken from each sheep. This gives to the wealth of the country nearly twice the price once paid for the support of a sheep. Not only has the quantity of wool grown on each sheep been increased, but its quality has been greatly improved, until, to-day, it is possible for the American farmer and mechanic to go better clothed, for fewer days' work, than at any previous time in the history of our country.

While the farmers of the United States have been thus enabled to increase their food supply, and increase rapidly the raw material for the clothing of our people, the effect of the tariff on woolens has been correspondingly beneficial.

In 1860 we were largely dependent for our wools and woolen goods upon foreign wool growers and foreign manufacturers at such prices as they were able to dictate. Now the woolen fabrics used by our people are mainly manufactured by the skill and labor of our own artisans from the products of our own flocks.

It is said "no attentive observer who visited the Centennial Exposition failed to notice the astonishment with which the French and English manufacturers examined the fine clothing produced by American looms; and no feature of that great exhibition reflected more credit upon American enterprise and skill." We have improved upon the old and introduced new fabrics, until our skill in manufacturing good and substantial clothing is attracting much attention in the markets of the world, and our staple is now a marvel of cheapness under a protective tariff. The quartermaster general of our army recently said, "that when quality was considered the army of the United States was clothed more cheaply than any army in the world." And a most intelligent gentleman, who has traveled around the world in a suit of clothes made of American wool and by American manufacture, costing but $12—coat, pants, and vest—said, "it was everywhere in foreign lands praised for its neatness and cheapness."

Tariff on wool and woolen goods has destroyed monopolies, and largely benefited farmers and artisans by increasing the number of woolen factories, and, of course, increased the quantity of the manufactured articles, and, of necessity, diminished the price of the articles by increased competition, while an increased demand was created for the raw material, and breadstuffs and labor were inevitably enhanced in their value. Thus protection has encouraged manufactures, and they have built up in our midst, and brought our market to our immediate localities.

But all this, even, is not the full measure of the benefit wool growers and the country have derived from the tariff. We must thank the tariff that we have a wool-growing industry worth the name.

For some years preceding the enactment of our tariff, the Metsiza wools of South America, raised on perpetual grasses, and with little or no labor, and by men who paid no taxes on land or stock, were flowing into our ports in quantities that threatened to supplant the home-grown product almost entirely. It was then the tariff came to our relief, and by the duty then imposed, shut out this avalanche that threatened to extinguish the fires of our manufacturers, and place our artisans and their industries at the tender mercies of the English manufacturers. Thus, it gave us a fair chance in our own market, despite the fact of high taxes and shrinkage of values that followed the war.

Had the bill, which was barely defeated in our last Congress, become a law, it would have been fatal also to the industry, as it would have been impossible for our wool growers to have competed in their own markets with the foreign wools, and it would have been equally impossible for our manufacturers to have competed with those of England and France.

The bill proposed to cut down our present tariff over one-half, and to strike a dead level of an *ad valorem* duty on all wools and woolens, wholly disregarding the relations and adjustments which the wool grower and woolen manufacturer had made, and sustain to each other.

Of course any legislation that destroys the woolen manufacturers, is equally destructive to sheep husbandry, for the farmer would no longer have a market for his wool.

The grower is the first link in the industrial chain that converts grain and grass into wearing apparel, and he is as necessary to the existence of the manufacturer of cloth as the manufacturer is to the wearer of it.

These two interests are identical, and any tariff antagonizing one with the other could not remain long undisturbed. There is a common interest of each with the other of supply and demand that must not be lost sight of.

But it might be urged that a tax should not be levied upon the clothing of a people. This would be a good objection, were it not for the fact that objects of the highest national importance are secured by its imposition. That forty or fifty million of people should be able to clothe themselves, without helpless dependence upon other nations, is a matter of transcendent importance. What American can be indifferent to the fact that in the year 1875 the State of Massachusetts alone produced 992,000,000 yards of textile fabrics, and in doing so consumed $75,000,000 worth of the products of the field and flocks, and gave employment to 120,000 artisans.

Dare anybody say our manufacturers could have attained their present success without protection. And to have abandoned them, as our Congress came so near doing at its last session, would have prevented their continued usefulness, and would have transferred their profits to our rivals in foreign lands, and would not have materially cheapened the cost of the furnished product to the American consumer. That nation can hardly be called independent, that does not possess the material and skill to clothe its own people.

We oppose a change in the tariff on wool for the following reasons:

1. Because there are no circumstances in the condition of the country, nor indications of a general public opinion demanding a change, and in the present state of the industry, a reduction of the tariff would cause a wide-spread shrinkage of values consequent thereon, and cause a depression of the business generally.

2. Because the existing tariff was constructed by the aid of consultations and concessions between the wool growers and woolen manufacturers of the United States, having the most intelligent information in regard to their respective industries, and with a care and deliberation without parallel in the history of our revenue legislation.

3. Because the existing tariff has been so signally beneficial in developing sheep husbandry and woolen productions generally, improving old and introducing new fabrics, and in cheapening them to the consumer.

4. Because under its protective influence the sheep husbandry of the United States has made a progress unequaled in any part of the world in the same period of time; while it has declined in Germany, (formerly ranking at the head of the wool-producing nations,) France and England. But in the United States it has advanced in a constantly increasing ratio. For these reasons and under these circumstances, and in this condition of the country, it is the dictation of prudence and of common sense to let well-enough alone.

GREENCASTLE, IND., January 4, 1882.

Mr. Clark. There is only one point but what was touched upon. Without a tariff, we have in this country to compete with what is called pauper labor in Europe. The operatives are ground down there until they are hardly given a subsistence, and without a tariff it would be the same way here.

The President. Another point is we raise a revenue in that way instead of by direct taxation.

HOW SHALL WE SUPPLY THE LOOMS OF THE UNITED STATES WITH ALL THE WOOL THEY WANT?

BY ROBERT MITCHELL, GIBSON COUNTY.

Mr. President, and Gentlemen of the Indiana Wool Growers' Association:

In obedience to the programme of this meeting, I have prepared a few thoughts upon the subject assigned me, namely, "How Shall We Supply the Looms of the United States with all the Wool They Want?" It seems in arranging this programme but little thought has been bestowed upon it, for I find in looking over it, that there are three subjects assigned to three different members of the association, so near alike, that a paper upon one will be almost sure to contain more or less of the same facts. I allude to the articles, "How Shall We Increase the Number and Quality of Our Sheep?" "What has Tariff done for Sheep Husbandry?" and, "How Shall We Supply the Looms of the United States with all the Wool They Want?" Now the question assigned to me is easily answered. Increase your flock; by so doing you will increase the production of wool. But I fancy I hear some one saying, it don't pay to grow wool, too much trouble to take care of sheep. That is the answer in which the shiftless farmer finds relief in all that he undertakes to do. Shifts off his sheep because of a little trouble, shifts off his other stock, and finally shifts off his home and moves to Kansas. Wool growing is not only a pleasant business, but a profitable one. And the wool growers of to-day must look ahead to be able to meet the wants of the trade. The spindles of the United States to-day are busy spinning the wool produced in other countries. The question for the wool grower to answer, is, why is this? Is it because our lands are not adapted to wool growing? No. Is it because our farmers dislike pastoral farming? No. Is it because our climate is unsuited to sheep husbandry? No. Then why is it that the spindles of the United States are not kept busy spinning the wool of this country? First, because the Legislation of the States has been in the interest of dogs and their admirers. Second, because of the imperfect tariff laws not protecting that valuable industry. Indiana now has, as I believe, one of the best laws protecting sheep from dogs, which, if it can be enforced, will increase our wool product 100 per cent. in two years. In 1878 Indiana had 3,117,058 acres of pasture lands. The same year we had 906,849 sheep. About three acres to the sheep, and the same year 1,860,178 pounds of wool, or an average of about two and one-half pounds of wool to the sheep. Now you will admit that our lands are capable of supporting five sheep to the acre, and I believe you will also admit that an average of five pounds of wool to the sheep can be easily obtained. Then our 3,117,058 acres of pasture with five sheep to the acre would give us about fifteen millions of sheep, and at five pounds to the sheep, seventy-five million pounds of wool. This is a fair calculation, for it is no uncommon thing now to find many flocks of sheep averaging ten pounds of wool to the sheep. In 1880 we had 1,538,860 sheep, in 1881, we had 1,612,865 sheep, showing an increase in 1880 of 642,014; and in 1881, 74,005 more than in 1880. The wool clip of 1880 was 4,494,037 pounds.

Let us then, farmers of Indiana, see to it that the present law protecting sheep is enforced. Also, strive to increase the number of our flocks, and, by the selection of pure-bred bucks for use, increase the quantity and quality of our wool. Also, by taking better care and providing suitable shelter for our sheep. These are the improvements we need to supply the wants of our looms, and when we bring about these conditions by our industry, and the other States of the Union will do likewise, the wool manufacturers of this great country will exclaim, "Hold, enough!" And the vast sums of money that annually leave our shores for the purchase of wool and woolen goods will remain at home to gladden the heart of the husbandman. It has been said of old that the sheep was the animal with the "Golden hoof," and the Nation that counted its sheep by the millions was a Nation of wealth and influence, and its people a happy people.

The question of castrating and docking lambs was brought up for discussion.

Mr. Clark. I think about as good a way to tell my judgment in regard to that will be to relate my experience. In the first place, I was taught to castrate and dock at an early age. I have taken many a one before it was many hours old and cut its tail off with my knife. I never have my lambs come early like some do. I have them along the latter part of April and early part of May. If there comes a rain and it turns cool, many a time they take cold from their tail being docked and die. They will be very pert in the evening, and sometimes be dead the next morning. I never lost many by inflammation from castration. In learning more about the matter, I just took out the testicles, and cut them clear from the membranes, and pulled out as much of the cord as would come. They will hardly ever be sick from it at all. An objection to castrating at a very early age is, the coating of the testicle is so tender that it will sometimes burst, and will leave enough there to make them what we call a little staggy afterwards. They will fight bucks, and try to cover ewes. I leave the castrating now until the lambs are about done coming, and attend to it all at once. I done the docking at that time too for some time, but the difficulty was, there being trouble with the flies. To avoid this I use some tar, or something that has a turpentine smell to keep the flies away. I have frequently had lambs disowned by their mothers; they would turn and smell the turpentine, and disown them entirely, and I had considerable trouble to get them to own them again. Now I castrate in the spring and dock in the fall, when all danger of flies and hot weather is over. I have not lost one case in a hundred.

Mr. Cotton. How old do the lambs have to be before you castrate them?

Mr. Clark. I don't want them to get a month old. I would do it at the age of a week or ten days old.

Mr. Howland. With your lambs that you castrate in May, do not the flies sometimes bother them?

Mr. Clark. I generally put a little tar on the scrotum, and I never have any trouble with them in that way.

Mr. Howland. Do you think there is more danger from bleeding from a wound in the scrotum, than from severing the cord.

Mr. Clark. No; but the fewer vessels to cut the better.

Mr. Howland. When you split the side is it not apt to gather in the end of the scrotum?

Mr. Clark. The only time I ever had any trouble was when I selected some buck to keep for my neighbors at their request, and they did not come after them, and I let them go too long. I trimmed them, and it turned cold and commenced raining the next day. They took cold, and it clotted the scrotum. Two of them I got hold of in time to clean them out, and they got well; the others died. It clotted until it could not discharge, and that was the cause. I have not lost any for some years.

Question. You pull the testicle clear out, cord and all. Can you do that with yearling bucks?

Mr. Clark. Yes sir; I have tried it on some of older age, some few. No difficulty in any respect.

Mr. Robe. The reason for that I suppose is, that a blood vessel will not bleed when it is broke like it will when it is scraped. The sharper the tool the less it will bleed. How do you dock your lambs—with a knife?

Mr. Clark. No sir; I do it with a hatchet. Shove their buttocks up against a block, let one hold them, pull the skin up towards the body as tight as you can, and chop it off.

Question. You don't strike it do you?

Mr. Clark. Yes sir, I strike it. I stretch the skin up so it will cover the end. I tried a chisel with three. I will never do it with another. I ground the chisel up for the purpose.

Question. What was the trouble with the chisel?

Mr. Clark. Sometimes they would roll under it. As soon as I found the joint, which took time, the lamb would give a kick, and that would be to hunt over again. You have got no chance to shove the skin back.

Mr. Farquhar. How long do you want to leave the tail?

Mr. Clark. That is owing to the size of your ewe. I want the tail off of the sheep because it is sometimes the source of a disease to them, and because if a sheep ever begins to cloy a little on corn, it is very apt to scour, and you can not change from dry feed to grass without the sheep scouring; then I want the tail out of the way.

Mr. Beeler. I don't think it is any use to them.

Mr. Clark. I have cut old sheeps' tails off that appeared to be stiff; take hold of them and they are as hard as a bone. Some say if that was left alone stiff and hard, it would occasion their death. About that I don't know.

Mr. Cotton. My experience in that line has not been large. I operate in a somewhat different manner. I have never had any trouble in docking.

Mr. Thompson. My friend's mode is different from mine, and different from what I really think is the best mode, and I would hate to have it go out as being indorsed by the Wool Growers' Association of Indiana. It might mislead some. I do not think it is the best plan. My plan of docking is to take the lambs not over two weeks old. I think the block plan is a very good one, that has been so often explained by my friend, McDonald. I let one of the boys hold the lamb, and I take a knife and cut the tail off. I have had very good success. I don't put any grease or anything on it at all. There may be better ways, but that is much better than letting the lamb go until fall or shearing time. I have lost lambs when docked two or three days old; they would bleed to death, they have very little blood to spare. You had better not try docking lambs two or three days old. In castrating I cut the end of the scrotum off, say about the third of the end of it. I don't cut quite as close as I used to. I do that with a strong pair of sheep shears, very sharp. It don't dull the shears like it does a knife. I push the skin up and draw the seeds out, not with a rapid motion (that always shocked me) as in my friend McDonald's operations. I don't put any tar on it. I never tried tar but once, that was a little late in the season. The tar clotted it up and I lost some lambs by it. I don't dock and castrate my lambs at the same time. I dock them and leave them until the tail heals up. There is not near the danger from flies in castrating that there is in docking. That has been my experience.

Mr. Darnell. How long do you leave the tail?

Mr. Thompson. That is a matter of taste, to some extent. I want tail enough to cover the parts nicely, so that it will look decent. I want to leave tail enough so that the wool on the sides of the tail will hold it up. When cut too close on Merinos we have some trouble, as found by the experience of some of my neighbors. I cut longer, and do not have that trouble. If you want to make a nice show sheep, you want to cut pretty close, it makes them look square behind. The English perform the operation at the second joint. I have seen sheep that had not a sign of a tail. When cut close we have not that trouble to make the sheep look square behind, but they have more trouble to keep them clean. I think if this information is for the general farmer, the tail should be about an inch and a half long.

Mr. Darnell. Do you cut in the joint?

Mr. Thompson. I aim to hit the joint as often as possible.

Mr. Howland. Do you dock the lambs in hot weather?

Mr. Thompson. No, sir. I would not dock my lambs in hot weather. If I had to dock them a little late on account of their coming late, I would do it in cool, cloudy-like weather, and do it in the evening, so they will haye the advantage of one night from the flies. I found it very much better to perform all these operations in the evening than in the morning. There can only one thing be said against it, if anything goes wrong of course we don't see them, but the other advantages overbalance that two to one. I would certainly perform all these operations of a cloudy day, and late in the afternoon.

Mr. Howland. You would not let it go to the cool weather in the fall?

Mr. Thomson. I am surprised that any wool grower should advocate that, with all due respect to my friend Clark.

Mr. Clark. All improvements are surprises to some people.

Mr. Thompson. If that is an improvement it is backwards.

Mr. Clark. In regard to performing this operation in the evening instead of the morning, there is one very plausible objection to it. They will bleed a great deal worse in the evening than in the morning. The more they have stirred through the day and the warmer the weather the worse they will bleed.

Mr. Beeler. I have been raising sheep a good while now. My custom has been not to perform both operations at the same time. I do not like to perform operations on a lamb too young. They are sometimes very weak, and the loss of much blood may cause its death. I generally take lambs from two weeks to a month old. I dock them, and let them get well over that before I castrate them. I usually take a sharp knife and cut the tail off. It is easier done than putting them on a block, and I think as good or better. Instead of doing it on a cloudy day, I had rather take a clear, pleasant day, not extra warm. I want particularly to avoid a cool day, just after it has been raining and cleared up again. I prefer the evening to the morning. In castrating I take off the end of the scrotum, as our friend McDonald spoke about. Of course, I once in a while lose a lamb. After docking I keep my lambs as quiet as possible; that is one advantage in doing it of an evening. I don't like them to be worried.

Mr. Thompson. In spite of anything we can do, they will come late in the season; then is when I want the cloudy day. I find when the sun is shining bright along in May, and it is warm, the lamb then bleeds a great deal more readily and rapidly than at a cooler time. That has been my experience. Without being considered vain in this matter, I will say, while I am a young man, I have castrated a good many sheep. I do not know how many hundred or thousands I have operated on, but I find a cloudy day much the best. I have performed these operations late in May when it was raining all day (when we were breeding later than we do now), and we had the very best of success. I would not do it on a cloudy, cold day; I try to be on medium ground in all these operations.

Mr. Clark. In regard to his doing much better on these cloudy days, I have castrated several hundred of them without losing one by it. How much better are you going to do?

Mr. Beeler. With all due respect to our friend Clark, I should be sorry the idea should go abroad that the Association endorsed his opinion, that late lambs should go until fall before being docked. I think that a very bad practice and can not endorse it.

Mr. Cotton. I can cover that by a resolution that it is the sense of this meeting that lambs should be docked at an early period in their lives.

Mr. Howland. Mr. Clark has said nothing out of the way. I have done that very thing simply because I was afraid to dock them in the extreme warm weather when the flies were very bad. I don't see any great impropriety in his remarks going in as his opinion.

Mr. Howland introduced the following resolution:

Resolved, That this Association earnestly request our Senators and Representatives in Congress to use their influence in opposition to any modification or change in the tariff on wool or woolen goods. Carried.

It was moved and carried that this Association appropriate $50 for the National Association. Carried.

Report of the Treasurer was then made.

It was moved and carried that the Secretary be requested to give the chairman the postoffice address of each member of the Association, and that the scale of points be sent to each member. Carried.

Mr. Farquhar. I move that we meet the first and second day in June next.

On motion of Mr. Farquhar the society agreed to give a premium of $1 first, 50 cents, second, on long wool, middle wool and fine wool, to be shown washed and unwashed.

The committee on scale of points made the following report:

SCALE OF POINTS FOR JUDGING SHEEP.

SCALE OF POINTS FOR COTSWOLD SHEEP—100 DENOTING PERFECTION.

Blood. Thoroughbred, purely bred from one or more importations of Cotswold sheep of some reputable breeder from England. 7 points.

Head. Not too fine; moderately small and broad between the eyes and nostrils, but without a short, thick appearance; and in young animals, covered on crown with long lustrous wool. 7 points.

Face. Either white or slightly mixed with grey, or white dappled with brown. 4 points.

Nostrils. Wide and expanded; nose dark. 1 point.

Eyes. Prominent, but mild looking. 2 points.

Ears. Broad, long, moderately thin and covered with short wool. 4 points.

Collar. Full from breast, and shoulders tapering gradually all the way to where the head and neck joins. The neck of rams should be short, thick and strong, indicating constitutional vigor. The neck of ewe should be fine and graceful, and free from coarse and loose skin. (Collar 5 points with ewe.) 6 points.

Shoulders. Broad and full, and at the same time join so gracefully to the collar forward and the chin backward as not to leave the least hollow in either place. 7 points.

Forelegs. The mutton on the arm or forethigh should come quite to the knee—leg upright with heavy bone, being clear from superfluous skin with wool to fetlocks, and may be mixed with grey. 4 points.

Breast. Broad and well forward, keeping the legs wide apart. Girth on chest full and deep. 8 points.

Fore flank. Quite full, not showing hollow behind the shoulder. (4 points with ewe.) 5 points.

Back and Loin. Broad, flat and straight, from which the ribs must spring with a fine circular arch, and scrotum of rams well covered with wool. 10 points.

Belly. Straight on underline. (5 points with ewe.) 3 points.

Quarters. Long and full with mutton quite down to the hock. 8 points.

Hock. Should neither stand in or out. 2 points.

Twist. Or junction inside the thighs should be deep, wide and full; which, with a broad breast, will keep the legs open and upright. 4 points.

Fleece. The whole body should be covered with long lustrous wool. 18 points.

POINTS OF EXCELLENCE FOR MERINO SHEEP—100 DENOTING PERFECTION.

General, 26 *Points.*

Blood. Thoroughbred—i. e., purely bred, from one or more of the direct importations of Merino sheep from Spain, prior to the year 1812, without the admixture of any other blood. 1 point.

Constitution. Indicated by form of body; deep and large breast cavity, broad back, heavy quarters, with muscular development, forming capacious abdomen. Skin thick, but soft, of fine texture, and pink color; expansive nostril; brilliant eyes, healthful countenance, and good size, age considered. 15 points.

Size. In fair condition, with fleece of twelve months' growth, full-grown rams should weigh not less than 150 pounds, and ewes not less than 110 pounds. 7 points.

General appearance. Good carriage, bold style, elastic movement, showing in particular parts, as well as general outline, symmetry of form. 3 points.

Form, 34 *Points.*

Body. Throughout, heavy bones, well proportioned in length, smooth joints, ribs starting horizontally from backbone and well rounded to the breast-bone, which should be wide, strong and prominent in front; strong backbone, straight and well proportioned as to length. Heavy, muscular quarters, deep through and squarely formed behind and before, with shoulders well set on, neither projecting sharply above the backbone, nor standing so wide and flat as to incur liability to slip shoulder. Folds on the ram should be larger than on the ewes. Large and pendulous folds from the chin or jaws succeeding each other down the neck to the brisket, ending with large fold or "apron," and extending up the sides of the neck, but lighter if at all extending over top of neck, also behind the foreleg or shoulder, one on front of hind leg, hanging well down across the flank, also on rear of hind legs, or quarters, extending upwards toward the tail, with one or two on and around the tail, giving the animal a square appearance on the hind quarters, and straight down as may be from end of tail to hock joints and hind feet. 18 points.

Head. Wide between the ears, and between the eyes and across the nose; short from top of head to tip of nose; face straight, eyes clear and prominent; ears thick, medium size, and, together with face, nose and lips, white and covered with soft fur or downy wool. Ewes should give no appearance of horns; while upon rams the horns should be clear in color, symmetrically curved, without tendency to press upon the sides of the head or to extreme expansion. 6 points.

Neck. Medium length, good bone and muscular development; and especially with the rams, heavier toward the shoulders, well set high up, and rising from that point to the back of the head. 5 points.

Legs and Feet. Legs medium or short in length, straight and set well apart forward and back, heavy bone, smooth joints, with large muscular development of the fore-arm; thick, heavy thighs, wide down to hock joints, and from knee joints downward covered with short wool, or the soft, furry covering peculiar to the ears and face; hoofs well shaped and of clear color. 5 points.

Fleece, 40 *Points.*

Covering. Tendency to hair and gare upon any part of the sheep is to be avoided. Evenness of fleece in length, quality, density, lustre, crimp, trueness, strength and elasticity, covering the entire body, belly, and legs to the knees; head well covered forward, squarely to a line in front of the eyes; well filled between the eyes and ears or horns, and well upon the cheeks; muzzle clear, with small opening up to and around the eyes. Scrotum of rams covered with wool free from tendency to hair. 15 points.

Quality. Medium, but such as is known in our markets as fine delaine and fine clothing wool, distinctly better in quality, luster, crimp, and elasticity than the wools of same length grown upon the common grade sheep. 5 points.

Density. Shown by the compactness of the fleece throughout, which should open free but close, showing very little of the skin at any point, even at the extremities. 10 points.

Length. At one year's growth not less than two and one-half inches, and as near as may be uniform in length to the extremities of the fleece. 5 points.

Oil. Evenly distributed; soft and flowing freely from the skin to surface; medium in quantity, and of a light color. 5 points.

POINTS OF EXCELLENCE FOR THE DOWNS SHEEP—100 DENOTING PERFECTION.

Blood. Purely bred from one or more of direct importation from Great Britain. 20 points.

Constitution. Constitution and quality indicated by the form of body; deep and large in the breast and through the heart, back wide, straight and well covered with lean meat or muscle; wide and full in the thigh, deep in flank, skin thick but soft and of a saffron color; prominent, brilliant eyes and healthful countenance. 25 points.

Size. In fair condition when fully matured. Rams should weigh not less than 200 pounds, and ewes not less than 175 pounds. 10 points.

General Appearance. General appearance and character, good carriage; head well up, elastic movement, showing great symmetry of form and uniformity of character throughout. 10 points.

Body. Well proportioned, small bones, great scale and length, well finished hind quarters, thick back and loins, standing with legs well placed outside, breast wide and prominent in front, brisket wide and extending well forward. 10 points.

Head. Short and broad; wide between the ears and between the eyes; short from top of head to tip of nose; ears short, of medium size and covered with downy wool; head should be well covered with wool to a point even with eyes, without any appearance of horns; color dark brown in some families, and fawn color in others without speck or spot; light muzzle not objectionable. 10 points.

Neck. Short and heavy, especially towards shoulders. 5 points.

Legs and Feet. Broad and short and well set apart, color same as head and wooled to the hoof, which must be well shaped. 5 points.

Covering. Body, belly, head, and legs well covered with fleece of even length and quality. Scrotum of rams well covered. 10 points.

Quality of Wool. Medium such as is known in our markets as "medium-delaine" and "half-combing wool," strong, fine, lustrous fiber, without tendency to mat or felt together, and at one year's growth not less than three and one-half inches in length. 5 points.

CAL F. DARNELL,
JOHN L. THOMPSON, } Committee.
URIAH PRIVETT,

CLASSIFICATION OF SHEEP FOR COUNTY AND DISTRICT FAIRS.

Made for and endorsed by the Indiana Wool Growers' Association.

Rule.

Stubble or otherwise improperly shorn sheep shall not compete, and not be shorn before 1st of April.

Class A.

Fine wool sheep, to include American, Spanish, Saxony and French Merinos.

Class B.

Long wool sheep, to include Cotswold, Lincoln and Leicester.

Class C.

Middle wool sheep, to include Oxfordshire, Shropshire, Hampshire and Southdowns.

Class D.

Cross bred sheep.

ARRANGEMENT OF THE DIFFERENT CLASSES FOR THE SHOW RING.

Class A, B and C.

Best Buck two years old and over.
Second best Buck two years old and over.
Best Buck one year old and under two.
Second best Buck one year old and under two.
Best Ewe two years old and over.
Second best Ewe two years old and over.
Best Ewe one year old and under two.
Second best Ewe one year old and under two.
Best Buck lamb.
Second best Buck lamb.
Best Ewe lamb.
Second best Ewe lamb.
Best Buck with five of his best lambs.

Your committee thinks the adoption of the above classifications by the county and district fairs would greatly benefit and encourage the wool growers throughout the State, and would also be beneficial to your fairs and associations.

CAL. F. DARNELL,
JOHN L. THOMPSON, } Committee.
URIAH PRIVETT,

REMARKS.

We, your committee, respectfully suggest to the managers of county and district fairs that they discard the general sweepstakes premium, and substitute in its place a sweepstakes premium in each class except cross-bred,

That they rigidly enforce the rule at the head of the classification,

That they adopt the one man or expert system of judging, and use the accompanying scale of points of excellence, which was adopted by the Indiana Wool Growers' Association at its January meeting, in 1882.

CAL. F. DARNELL,
JOHN L. THOMPSON, } Committee.
URIAH PRIVETT,

Since the adoption of this Scale of points and system of Judging Sheep, the Indiana State Board of Agriculture has adopted the same.

It was moved by Mr. Farquhar that the secretary send the scale of points to the different county agricultural societies. Carried.

Mr. Dungan. I do feel very much interested for one in this matter. We all know what defects our State fair and county fairs labor under in regard to awarding committees. We have all seen this and all felt it, even our superintendent has had considerable to do with this matter. I think that one expert, one judge system far excels all others. I have been in favor of it for a number of years, and in reading our Live Stock Journal on this subject, our best writers in this State and in the different States, I find that they all approve of it. I will, therefore, move that we recommend to the State Board of Agriculture that they adopt this system in our sheep show next fall.

Mr. Thompson. My experience in this matter is limited. If you can get an expert that is competent, the one judge system I think is in advance of three men, for you can get the responsibility upon somebody's shoulders. He has got to give some substantial reason for what he does. He can't say this man or that man did it, but I did it, and give his reason.

Mr. Darnell. In regard to this expert business, there may not be very many of them in Indiana, but Ohio, Illinois and Missouri has them. There will not be very much trouble in getting one of them here to do this business.

Mr. Mitchell. I had a paper on this subject last year. This expert system is a good one. It has its faults. One is, if you get a poor judge, he has exclusive control, and when there are three men he will be but one of three. In regard to going to Missouri or Ohio, I don't want any idea of that kind ever entertained here. You may do that for the purpose of swapping backward and forward.

Mr. Darnell. I said in case we did not have any that we could get here.

Mr. Thompson. I want to amend the motion by making also a suggestion to our county fairs to have expert judges.

The amendment and original motion were carried.

The committee on programme made the following report of programme for next meeting:

1. President's Address.

2. What is the Best Mode of Wintering a Flock of Fifty or More Sheep?—*W. L. Schooley, Arcana, Ind.*

3. What Course shall we Pursue to Increase the Number and Quality of Sheep in Indiana, or What are the Requisities to Success?—*Dr. J. P. Forsythe, Forsythedale, Ind.*

4. What is the Most Profitable Sheep for Indiana?—*C. A. Howland, City.*

5. Judging the Different Brands of Sheep by Standard.—*T. W. W. Sunman, Spades.*

6. The reason why every Farmer should Raise Sheep.—*I. N. Cotton, Traders' Point, Ind.*

7. How shall we Breed and Manage a Flock of Common or Grade Sheep with the Greatest Profit?—*J. W. Clark, Arlington, Ind.*

8. What is the Best Mode of Handling our Rams through Coupling Season, and the Best Mode of Taking Care of Ewes after Coupling Time until Lambing? Also, the Best Mode of Caring for Ewes and Lambs until Weaning Time?—*F. W. Hudson, London, Ont.*

BEE-KEEPERS' STATE ASSOCIATION.

INDIANAPOLIS, January 24, 1882.

As per call of the executive committee, the annual meeting of the Indiana State Bee-Keepers' Association was convened in the rooms of the State Board of Agriculture. The meeting was called to order at 9:30 A. M.; President James H. Orear in the chair. A call of the roll showed all acting members present. Committe on credentials, consisting of Messrs. Silvester Johnson, Jonas Schall and H. B. Stumph, was appointed by the chair. The report of which being received, the meeting adjourned to 1:30 P. M.

The meeting was again called to order, at the time designated on adjournment. Governor A. G. Porter being present, was called upon, and delivered the following address:

The value of the honey produced in this State in 1881 is reported by our Bureau of Statistics to have been $207,042. In 1880 the value of the product was $239,525. The reduction of value in 1881 was occasioned by a short production, which happened on account of the extreme severity of the winter, which was very destructive to bees, and from the drouth of the summer, which diminished largely the supply of nectar from which the honey is produced. This reduction was general throughout the country.

The production of honey is not one of the great industries of the State, though the business, when skillfully pursued, is, I am informed, quite a profitable one, and the climate and "pasturage" of the State are favorable to the bee and to a large product from its labor.

It will probably, not for many years to come, be pursued singly, to a very large extent, as an industry, but as a by-business of the farm, to amuse the leisure of the farmer's household, and at the same time add to the receipts of the year, it may be largely and most usefully extended. There is nothing about which more has been written than the bee and its habits, and the more these are studied the more interesting and engaging they become. Aristomachus, we are told, spent sixty years in the study, and Lord Brougham, the busiest statesman of his generation, took time to make chemical analysis of the honey-comb under various conditions.

The industry of the worker bee; the antipathy to the drones, which leads to their being put to death as idlers so soon as their function in the hive has been performed; the neatness of the hive, which the tidiest housekeeper might desire to emulate; the bravery with which enemies are met and withstood; the filial devotion to the queen as the mother of the hive, to sacrifice life for whose defense is a duty never declined; the mechanical ingenuity displayed in the structure of the comb and the arrangement of the hive; the sending out of scouts, when the hive has become over populous, to seek a new habitation for the surplus population; the unerring skill with which these guides show the way to the newly chosen home—these things are well known and never fail to interest. And with all the study that has been given to the habits of the bee, there are problems of just as great interest remaining unsolved as there were a thousand years ago.

It is a good thing in any family to have something that will profitably amuse the leisure of its members. Idleness and vacuity most often seek pleasure in vice; vice offers few allurements to a busy mind. To have in a family, therefore, some by-business which will fill leisure hours with pleasurable employment—an innocent hobby, if you will please to call it so—is a most useful thing. It may be the raising of fancy poultry, or of small fruits—it may be the study of insect life, or of geology, or of botany, or of bee culture—whatever of these or of things akin to these it may be, an enthusiasm for them will be one of the best supports of industry and morality. Of these, perhaps, bee culture may be made the most engaging, because a study of the habits of the bee, when once entered upon, will grow more and more interesting, and the occupation itself may be made highly profitble. The pleasure of the employment is now heightened by improvements made in the hives, by which the operations of the bees can be better perceived, the honey more easily removed, and the employment rendered less laborious.

The interest shown by this Association in bee culture and the products of the hive shows that this industry is likely to excite more and more attention.

Like the butter maker, however, you are met by competition. It takes an extremely delicate palate to distinguish between oleomargarine and any other than the very best quality of butter. Oleomargarine is eaten every day on, perhaps, a fourth of the tables of our cities, without a suspicion that it is not butter. The artificial honey is hardly less deceptive, and unless honey is eaten from the comb, there is little assurance to the ordinary palate of its purity. It is said, however, although the bee is now assisted in the work by manufacturing for it the base of the honey comb, that human skill has not reached the point of manufacturing cells which will pass for genuine cells of the comb. So far your industry is protected from the ingenuity of imposters.

The President. I am opposed to having any paper passed by without discussion, and as Gov. Porter has made some very good remarks to the society, I hope that the members of the society will fully discuss the subjects brought out.

Gov. Porter said he had read that comb honey had been adulterated to some extent, and should like to hear from some of the members on the subject.

Mr. Muth. I think that comb honey is not adulterated. He had seen items in the public press to the effect that artificial comb had been made and filled with glucose, and then sealed with a hot iron; but it was a mistake, it could not be done. We have a process for making comb foundation, which the bees work out and fill, but it is all pure wax, and makes pure comb honey. Extracted honey is adulterated to a great extent. It has been done chiefly in large cities like New York and Chicago. Honey dealers there were not satisfied with good, reasonable profits. Before the advent of glucose they adultered with sugar, but since glucose has become so cheap, three or four cents a pound, they use that, adding six or eight pounds of glucose to one pound of honey. This traffic has almost ruined the sale of extracted honey in those cities. In Cincinnati we do not adulterate the honey, and have a good sale for extracted in almost any shape.

Gov. Porter. Can this glucose honey be readily distinguished from pure honey?

Mr. Muth. It is very readily detected by experts, but by those who are not in the habit of using much honey it is not so easily detected. Each kind of honey has its own peculiar flavor, depending on the source from which it is gathered, locust, white clover, linden, etc. Pure honey has a peculiar acid which causes a tickling sensation in the throat, while glucose has no taste whatever, but readily partakes of any flavor with which it is mixed.

Gov. Porter. Prof. Collett, what do you think of the practicability of making the entire comb by artificial process?

Prof. Collett. I have never seen it done. I should doubt very much its practicability. I have seen the statements in the newspapers, but I have never seen it done. In fact, many people prefer to buy extracted honey when they can get it pure.

Mr. Cotton. Do the bees make honey? Is there any chemical change of the substance which they extract from the flowers, or do they simply put it into the comb as it comes from the flowers?

Mr. Daugherty. I think there is some kind of a chemical process takes place, at least the nectar while in the honey sack of the bee partakes of this peculiar acid of which mention has been made, although we have had syrup stored in the combs for wintering purposes which lacked this acid taste or effect.

Gov. Porter. What is the office of this acid, what is its function? Can not chemists ascertain what that acid is and supply it to artificial honey?

Prof. Collett. I do not know that that has ever been attempted. There is a peculiarity in bees, ants, and all such insects as that, that has not only a peculiar taste but wonderful medical effects. This acid is not known in commerce, although it is used to some extent in the medical profession.

Mr. Rabb. The Governor speaks of bee-keeing as only a by-business. I think bee-keeping can be made just as profitable a source of income as any other business; just as good as poultry-raising, butter-making, etc.

Gov. Porter. I said that it would be pursued in fact among us as a sort of by-business, because we were more interested in the larger industries of raising wheat and corn, and that generally it would be pursued among us as a by-business.

Mr. Daugherty. Though bee-keeping is very profitable, it will most generally be conducted as a by-business. It is equally sure and just as profitable as any of the other by-businesses to which our agricultural people must resort in their mixed farming pursuits of the well settled parts of the country. Not every one is fit to keep bees, neither is every one fit to raise cattle, hogs or sheep.

Gov. Porter. Suppose you wanted to get the people interested in the production of honey, how would you go about it?

Mr. Daugherty. By the aid of printing, conventions and societies. We should have the proceedings of this convention printed; we should encourage the forming of societies in every county in the State; we should have the encouragement of the State Board of Agriculture, the same as is given to other specialties; we should show to the people the many improvements of modern bee-keeping over the old styles, and teach them how we are able to take advantage of the instinct of the honey bee, and counteract as much as possible the false teachings of the patent hive vender of the past.

Mr. Muth. Bee-keeping is a very profitable business. We must admit that it is most generally conducted as a by-business, and, so far as I know, very often pays better than anything else on the farm. A friend of mine owns a farm of 160 acres near Cincinnati. He is one of the best farmers we have, and will take advantage of everything there is about him. He has perhaps an hundred stands of bees. A few years ago I bought from him 10,000 pounds of honey. This paid him better than all the balance of the farm, and every year I buy from him five or six thousand pounds of honey.

Mr. Schall. In respect to the business of raising honey and bees, no man must engage in it with the expectation of getting along without work. It takes work the same as any other business, and it takes close attention to make it a profitable business. In our part of the State we have a splendid bee country. Take it one season with another, as I have frequently argued with my neighbors, that there are enough sweets go to waste every year in our county (Fayette county), although a small county, to supply every family in the county with all the honey they would consume. Now and then comes a year like the last one, when there is but little honey to be gathered. It is owing to things over which we have no control. We have also unfavorable seasons for wheat and corn, but take it as an average business it is as profitable as any of the other industries.

Mr. Cotton. In order to be successful in the bee business we must get down to the fine points. We know only a certain class will do this, but when you find one who will study these fine points, you will find one who will succeed in the keeping of bees to some profit.

Prof. Collett. There was one idea suggested that if enlarged on is worthy of the attention not only of the bee-keeper, but of the householder and families and neighborhoods and nations. As a religionist and moralist, the bee is the grandest teacher in all the universe. Coming out of the land of romance and song and story, the bee shows the highest art of social life. They do their duty perfectly; their regulations, their cleanliness, their devotion, their industry, all go to form lessons which we should learn, to be able to govern ourselves better.

Gov. Porter. I have heard it said that there are some persons whom bees will not sting, and that there are some persons toward whom they have peculiar animosity. Is that a fact?

Mr. Muth. Persons that do not get stung are only such as do not go near them.

Mr. Daugherty. Any one handling bees will get stung more or less. With the improved methods of to-day, in handling we are much less liable to anger them, thereby avoiding many unpleasant stings. When alarmed the bees fill themselves with honey, while in this condition they are not apt to sting. By the judicious use of smoke we are able to control them so that the danger from stings is very little.

Mr. Muth. I have a few colonies of bees I will defy any person to go near them and not get stung. They are Cyprians. They have many good qualities, but they sting very much indeed.

Mr. Cottton. What is the average life of a worker bee?

Mr. Muth. It is considered they live about six or eight weeks.

Mr. Daugherty. The average life of the worker bee depends on the amount of work they do. During the height of the honey harvest they will work themselves to death in about six weeks; but during the winter months while they live in a semi-dormant state, they live as many months.

Mr. Cotton. When bees swarm, do the old bees go, or is it the young ones? Does the queen lead, or the bees?

Mr. Muth. If the queen is most in need of room in which to lay eggs she leads the swarm, but if the bees are crowded for room to store honey they create the excitement and lead off.

Mr. Daugherty. I don't think the age of the bee has anything to do with it. In swarming all the bees in the hive leave, many even that can not fly, which afterwards crawl back into the hive. The bees that are out in the fields at work, return and take care of the brood left in the hive.

Gov. Porter. It is said that the principal thing that prevents the general introduction of bees on farms, is the fact that they sting. Can no chemical be used upon the person that will prevent the bee stinging? Can you guard against it in any way?

Mr. Muth. Smoke is the only thing we can use to do any good; many things have been recommended to allay the pain of a sting, but they will not act in all cases, nor on all persons alike.

Gov. Porter. Is the pasturage for bees sufficient, or can anything be planted in the way of assisting them?

Mr. Fells. I think we can assist the pasturage very much by sowing white mustard, rape, melilot and alsike clover. Had it not been for melilot clover our bees would have been in a very bad fix last season.

Mr. Muth. We have not yet raised a crop for the bees alone, but only to assist them through some parts of the season. Mr. Jones of Canada, told us last fall at the National Convention that he had sown Buchara clover and raised large crops of honey from it, and on the strength of this I wrote to Germany for some of the seed which I will have in the spring.

Mr. Stumph. I have sewn considerable buckwheat for the past two or three years, and have got good crops of honey from it, and I think it pays well.

Mr. Fells. I think it very essential that we sow rape to give them a good start early in the spring.

Mr. Daugherty. We generally have a drouth between fruit bloom and white clover, which it is very necessary we bridgeover with some kind of a plant, as it comes at a time when it is very detrimental to the bees to run short of forage. Just at this time of the year we want to keep them at work rearing brood with all their might.

Mr. Muth. It is just like raising corn, wheat, or anything of that kind. We may plant our fields and cultivate them well, but if not a proper season it will not grow. Some seasons we have a fine crop of white clover, but it does not secrete honey. Occasionally we find during fruit bloom comes a cold wet spell so the bees can not work, although no plant that we have yields so much honey, early in the season as the fruit bloom. The gentleman (Mr. Stumph) spoke of buckwheat. In some parts of the county it is very successful. It does better in a cool climate. It does quite well in Michigan, but south of Cincinnati it does no good. Indiana is a favorable State for the honey bee. You have plenty of clover, locust, basswood, and poplar.

Governor Porter. Will bees work on red clover to any extent?

Mr. Cotton. Some few years since I had a meadow sown with English clover. I noticed the bees working very hard on it, which was a surprise to me. On close examination I discovered one part of the flower seemed to be dwarfed, and on this the bees were working.

Mr. Daugherty. I find that very much depends on the kind of land on which the clover stands. Cold, hard ground, when the clover does not grow too rank, the bees will work it, but in low, rich ground, where the floweret is large, they can not work to do any good.

Mr. Schall offered the following:

Resolved, That the thanks of this convention be tendered to our worthy Governor for his very able address. After the adoption of which the meeting took a recess of ten minuets for a social chat with the Governor.

At a call to order business continued by allowing bills for printing and postage. The Secretary offered his report as published in the Agricultural Report for 1881.

A query was sent to the desk as to what kind of foundation was the best to use, thick or thin, and why the best?

Mr. Muth. Thick is the best for the brood chamber, and is filled out quickest, but very much depends on the honey supply. While honey is coming in very rapidly any of it will be worked out very fast.

Query by a Member. What about the "fish-bone" in using foundations, is there any difference between thick or thin as to that?

Answer. Mr. Muth. If you use foundations which is heavy you will find the fish-bone. If you use a foundation with a very thin base you will not find it.

The President. I have used Vandusen and Dunham foundations. I like the latter much the best. I have put half and half of each kind in the same hive, and the bees would have the Dunham all drawn out before they would hardly touch the Vandusen.

Mr. Daugherty. We have made pretty thorough tests of the different kinds of foundation. We find but little difference so long as all the conditions are favorable. They work out Root's, Vandusen's, Dunham and Given's about alike, while it is new. Under all conditions and circumstances, we give the preference to the Given foundation, as they seem to work on this better when a little old than either of the others. But as friend Muth says, it all depends on how the honey is coming in as to how fast it will be worked out. We have been testing Given's wired foundation, and shall use that exclusively for the brood frames and for extracting. The wire strengthens the combs and does not interfere with the brood in any way. In fact, it makes a perfect comb in the frame.

On motion, it was decided to hold a night session, and the meeting adjourned until 7:30 P. M.

On re-assembling the President delivered his annual address.

Ladies and Gentlemen of the Indiana Bee-Keepers Association:

According to the custom of our society, it becomes my duty before leaving the chair, which I have had the honor, through your kindness, to fill for the last year, to make some few remarks on the various topics that have come under my observation since we last met.

I am aware that it is customary on occasions like this to begin with an apologetic exordium, but I have ever thought the custom one more honored in the breach than in the observance. Yet there are special reasons why I should throw myself on the kind indulgence of my audience to-day.

The position I hold is a novel one to me. It seems incongruous indeed, it seems the hardiest presumption for such a novice as myself, to stand up as the organ and exponent of apiculture, surrounded as I am by so many of the nestors and priams of bee culture. But I hold it to be the duty of every apiarist, young or old, to be ready always, when called upon, to give a reason for the hope that is within him. And since I hold myself second to none in fealty and devotion to apiculture, I make bold to bring my humble tribute, and lay it beside many brighter garlands upon the shrine of our society.

Since our last meeting many of our brightest hopes and fondest anticipations have been blighted. The death angel has passed our way, and many who failed to have their hives in proper shape, have found on awaking after the long winter, "articulo mortis" written over the doors of many of our most beautiful colonies. And even whole apiaries have been swept away by the destroyer. The complaint was not confined to our locality, but whole neighborhoods, and in fact so far as I have been able to ascertain, the whole country more or less has suffered, especially the improved portion, while the unimproved or newly settled portions away from large orchards and sorghum factories suffered the least. The cause of this wide spread disaster should claim our attention at this time, and if there is any way by which we can avoid another visit of this disaster, we should improve it. We find that no manner of wintering served as a preventive, that is, so far as packing, etc. was employed, for I find that those who had their bees in their cosiest works did not escape, while in some few cases those most exposed passed through all right. Now I have attributed this to allowing our bees to go into winter quarters with uncapped honey. I know that some of our very successful apiarists do not agree with me in this matter; so also some deny that bees ever have dysentery.

Now, I find that if the fall is late and forage good, bees do not collect stores from cider and sorghum, and as a consequence the honey that is collected is all capped, and there is no trouble about dysentery and loss of bees. But in the fall of 1880 we had an early frost, just in the midst of fall harvest, and the bees had to fill their hives with poor honey. Now in the fall, before putting my bees in the house, I threw out all the unsealed honey in about half of my colonies, and not one of those so treated died, or had any symptoms of dwindling. In the spring they were healthy, and full of brood. But those that I neglected to deprive of the unsealed stores all died, and left hives full of honey. Now what was the condition of this honey? I answer it was in a state of fermentation. What was the nature of this fermented honey? On the answer of this question, will hinge the whole argument. What does science teach? Without appearing to be either learned or exact, but correct, I answer "by fermentation, sugar is converted into carbonic acid and alcohol." An atom of grape sugar (C, 2 H, 2 O, 2 + 2 H O) having parted with its two atoms of water by heat, gives rise to four atoms of carbonic acid and two atoms of alcohol. Now this is the precise process through which the stores collected in the fall of 1880 passed. That is, by fermentation they were converted into carbonic acid and alcohol. The early frost destroyed the crops of honey, and they had of necessity to collect from cider and sorghum; and of necessity they had to go into winter quarters with this uncapped food. At least that portion gathered after the frost was uncapped. Bees will not cap honey until it is ripened, and as cider and sorghum will not ripen, they will not cap it.

From the above, any one that knows any thing about the constituents of food can see that there is not an element of food in all this fermented stuff. It is a principle in scientific alimentation that any thing taken as food that interrupts normal assimilation and nutrition, instead of promoting them, is a poison. Pure sugar becomes a generator of heat to bees in the following manner: Sugar is rich in carbon, which is held in solution in the circulatory organs of the bees, and by degrees unites with the oxygen, and the union of carbon and oxygen is always attended with great heat. Now it is a fact in physiology that alcohol does not generate heat, but on the contrary lessens the amount of heat by hindering the union of carbon with oxygen in the process of digestion.

Now I think there are many other unnamed reasons why these fermented stores are not suitable for bee food.

We find it hinders oxygenation, and, therefore, prevents heat being developed. It lowers nerve tone, and, too, in the end weakens. It irritates, and therefore exhausts. While, so far as I have been able to discover, it does not give an adequate return.

So, then, before going into winter quarters throw out all uncapped food, and thereby avoid the rock on which we all have stranded. What apiarists of to-day want to do is to improve on what we have learned, and be open to conviction, and learn from any and all sources, for it is by gathering a little here and more there that we have arrived at our present status of apiarian knowledge. When we look back over the past, we can see we have made rapid strides in the last few years, for apiculture dates far back into the distant past. Yes, it is old, mossgrown and gray. We date her origin back to the misty past, long before God gave the fruitful land of Canaan to Moses and to Israel, e're the gentle Delila played with the locks of the mighty Sampson.

We can see her foot prints in the land where Homer wrote and Sapho sung. Her childhood hours were spent in sunny Italy, that

> "Land of memory and freedom dear,
> Land of the melting lyre and conquering spear,
> Land of vine-clad hills and fragrant groves,
> Of arts and arms, of genius and love."

"We can picture her as she dwelt like a gentle dove in her retreats, remote from the clamor of war, when the northern barbarian swept down like an avalanch upon the eternal city, and thundered at the gates of Rome, snatching the scepter of empire, from the nerveless grasp of the mistress of the world, and leaving her buried, like a mighty mammoth, under Siberian snows."

"Yes, I can see her marching down the corridors of time, bearing the centuries lightly upon her shoulders."

"In an area of forty-five square miles in Attica, Greece, it was estimated in 1865, that there was 20,000,000 colonies of bees. In all ages the abundance of flowers has made Hymettes famous for its honey. And as long ago as 1681, while Sir George Whealer visited the monk of Mendali, Monastery of Pentilucdas, they had 5,000 colonies. In 1860 a few colonies of Italian bees, which had long been a favorite of European apiarists, were imported to the United States, and they are now the most popular, prolific and profitable bees kept in the country. Their superiority over the native is in their larger size and greater beauty, they are more prolific, longer lived, more industrious, and less sensitive to cold, they swarm earlier and more frequently, and continue later, and are more docile than the common bee.

More has been done in the last two decades and a half by discovery and invention, to perfect the science of apiculture than in all the ages that preceded us, as far as can be ascertained. We would not pretend to say to what extent apiculture had advanced before the destruction of civilization by northern barbarians, for when we compare our present scientific, agricultural and architectural improvements to those of Greece and Rome, it is not to be supposed that they had neglected this important and beautiful branch of industry. But it was left, as far as we know, to that greatest of bee masters, our own Langstroth, with that inventive genius characteristic of the invincible Yankee to renew the pursuit. And since then we have had a flood-gate of inventions and improvements opened, until now we are sitting in the full blaze of apicultural light.

The next thing that claims our attention is one that is of great interest to us, especially those of us who are just embarking in the business of keeping bees, and I suppose a convention could not be closed without something being said on this subject, which is the wintering of bees. I believe there is only two modes, that is out and indoors wintering, and I believe that preferences are about equally divided. I am satisfied from experience and observation, that indoor wintering is attended with the best results, for I have tried both, and have always had better results from indoor wintering. It is not necessary to state to this Association that I have an apiary house, for I belive I have given you a description of it at the two former meetings, but will merely give my reasons for preferring it, to wintering on the summer stand. I believe that it is considered that you can winter on less food than on summer stands, from the fact you can have a more even temperature in the house than out, as it is not subject to the changes of weather.

And your bees are more quiet. I think that the only objection to indoor wintering is want of some way to get rid of the dampness that is found in cellars. Now, in my house this is obviated by perfect ventilation. In the first place, I am not troubled with moisture from the change of weather, as my walls are double with a dead air chamber between them, and this precludes any possibility from cold or dampness. And there are arrangements by which you are able to keep it at a point above which moisture is deposited 45° and 50° temperature. So I never disturb them unless to remove them to summer stands for a cleansing flight. I am satisfied they will keep better, as my bees did not consume over three or four pounds of honey last winter, and consequently they did not have that peculiar dysentery, so common to bees that have been kept on summer stands, or in damp cellars, or poorly constructed houses; for the bees that are subject to change of temperature have to take on more honey to keep up the necessary warmth, and thereby they distend their bodies, and from this distention the system is weakened and thus they are followed by spring dwindling, in other words, they are worn out from exhaustion, and die.

A vote of thanks was given the President for his interesting address.

Mr. Muth. You told us you lost half your bees that were in the house, can you tell us the cause?

The President. Yes sir. Those that I deprived of uncapped fermented honey are all right. Those that I left retain this honey died. Died with dysentery.

Mr. Muth. I suppose it will be interesting to our friends to know something about what causes dysentery. It is most generally caused by honey turning to alcohol. I believe this will come whether the honey be uncapped or not, if you cover your hives too tight. They will do all right if the honey is uncapped, if there is good ventilation above the covering or absorbents. The bees create this alcohol by raising the temperature of the damp hives. The exhalation not being able to escape remains in of course. The heat arount the cluster makes the hive very unwholesome and turns the honey into alcohol. Now, I think if we do not put our hives in proper shape to allow this moisture to escape, we make a very great mistake. The covering up of our bees is the principal part of safe wintering. I have in my apiary at present hives surrounded by chaff four inches thick. I have other hives with only a double wall, with tight air chambers all around it. I have a dozen single walled hives. In every instance where the bees are covered up tight they die, but where they have good ventilation they come out all right. Four years ago I covered my hives on the lower story, took the upper story away entirely; first put short sticks over the frames and covered with cloth to keep the bees down, but gave them room to pass over the top of the frames; covered the cloth with a straw mat, on this mat I placed two sticks, one at each end, on which I laid the cover, leaving an air space above the mat and under the cover. Since that time I leave the second story in place, but ventilate above the mat, by having two one and a half inch holes in the second story covered with wire cloth. We must allow this moisture taken up by the absorbents over the bees to escape.

The President. I will say that you can not generate alcohol without getting some amount of dampness. I do not know that dampness is the cause of fermentation. Heat is the cause of fermentation. When the honey is capped I do not think it possible to get up fermentation, because the principle on which fermentation depends is a germ floating in the air and it germinates by coming in contact with the uncapped honey. I want to make the distinction between capped and uncapped honey, ripe honey and unripe honey.

Mr. Schall. Ripe honey is that from which the moisture has been evaporated. That may occur in the hive or it may take place on the shelves. I have taken honey from the hives late in the fall when it was comparatively thin, and the same honey after being stored away for two or three months became very thick and ripe. We know that when bees are gathering honey very fast, especially after a hard shower, when night comes and the bees are all in the hive it is warm. They commence fanning to create a current of air in the hive for the purpose of evaporating the honey, and by morning the honey will be much thicker than it was the evening before. I claim that a great share of our loss one year ago was occasioned by the honey not being ripe. On account of the bad season they worked on all kinds of decayed fruit gathering the juices from all sources. The winter coming on so early did not give them time to ripen the honey. Had they have had a little more time to evaporate the moisture, I think they would have come through all right. I have had considerable experience with unripe honey, and I am satisfied that very much of the honey which is produced is not given sufficient time in which to ripen.

Mr. Muth. I coincide with my brother Schall, very considerably in many things. I have had much experience in honey, not only of my own raising but of others, and I think that too much stress can not be put upon this subject of ripe honey, not only for wintering but for the market as well. Honey is not always ripe when it is capped. It may be ripe for the bees but is not sufficiently ripe for use.

Mr. Daugherty. We, too, have had some trouble with unripe honey. At the start we did not know what was the matter. We had been taught that if the honey was sealed over that was sufficient, but we find that even honey in the comb and capped will sometimes sour or ferment. Comb honey after being removed from the hive should be placed in a very warm place, and kept there until it has time to become thoroughly ripened. Newly extracted honey should never be put into close vessels until it is well ripened. It should stand in open topped barrels for several weeks before being corked up in barrels or jars, and the longer it stands exposed to the air the better it becomes, and with that the hotter the room in which it stands the better. We place our honey in barrels with one head out, over which we spread a thin cloth, and we let it stand this way for eight or ten weeks before putting it up for shipment or sale. We do not think it necessary to allow the honey to be capped before extracting, if care is taken to ripen it afterwards. We extract just as fast as the combs are filled.

Mr. Muth. We should impress it on the minds of all our bee keeping friends, that too much care can not be given this one point in the care of honey, both for the interest of the bee-keepers and for the dealers.

Adjourned to Wednesday morning, 9:30.

SECOND DAY.

WEDNESDAY MORNING, January 25.

Meeting called to order at 9:30.; President Orear officiating, with all the members present. The first thing on the programme being the election of officers. The following committee on nominations was appointed, and retired for consultation: J. P. Catterson, S. Thomas, C. H. Daily, G. W. Gully and Mrs. E. Stout. Pending the action of the committee, the treasurer, Mr. I. N. Cotton, made the following report:

RECEIPTS.	
Balance on hands, 1880	$15 32
Receipts for dues	12 50
Total	$27 82
DISBURSEMENTS.	
Postal cards	$5 00
Postage stamps	4 84
Janitor's fee	2 00
Total	$11 84
Leaving a balance in the treasurer's hands of	15 98

Report was accepted and placed on the minutes.

Mr. Potts. While waiting the report of that committee, we would like to hear from our worthy treasurer, a member of the legislature, who said he would do all he could to get us an appropriation from that body, but failed.

Mr. Cotton. The reasons are very short. At the request of the committee appointed, I was willing to do any thing in my power to advance the cause in which we are interested. I appeared before the finance committee. The first thing they informed me was that we were not organized under the statute. The Wool Growers, the Swine Breeders and the Short Horn Association were all in the same shape. And that they made an appropriation for the Horticultural Society because they had complied with the statute, and that they would not feel justified in making an appropriation unless so organized, and I think they are about right. We will have to file articles of association, and become a legal association, that can sue and be sued; at the present time we are merely a social society. It is for the association to determine whether they will put themselves in that situation. It was the unanimous desire of the association that they should file the articles, in order to get the appropriation to make the society more influential, and to pay premiums on the best products of the apiary, and the different tools and devices in aid of bee culture.

On motion of Mr. Cotton, the President and Secretary were appointed a committee to file articles with the Secretary of State, and perfect a legal organization of the society.

Mr. J. W. Robinson remarked that his principal trouble was with the bee moth, and said he would like to hear some one on the subject.

Mr. Dougherty. As to the moth, there is no question but what the bees are fully able to take care of themselves, provided they do not have a hive which gives the moth all the advantage. If there is a crack or crevice about the hive that the bees can not get into, but large enough for the moth to live in, they will get in there and the bees are helpless. If the bees can get around them, there will be no trouble, if the colony is in good condition. It is just as much their instinct to take care of the moth and keep them out, as it is to take care of their honey. They will dig out the worms if they have to lay down the comb to get them out.

Mr. Robinson. I have suffered considerable from the depredations of the moth, let the cause be what it will, but my bees are now in good condition, and I hope to be able to get 200 pounds from each one this season.

Mr. Johnson would give considerable to be able to learn how to get 200 pounds of honey from each one of his colonies.

Mr. Muth. It appears that Mr. Johnson is a young bee-keeper. He can raise 200 pounds of honey to the hive, and he can raise more than this with a good season; but we can not get the honey unless the season is good. The last two or three seasons have been very poor ones, and we have done well to get forty or fifty pounds from each. Mr. Schall is one of our most successful bee-keepers, and I would ask him to give his manner of conducting things for the advantage of some of our new beginners.

Mr. Schall. I have had large yields. I have been rather bashful to publish them to the world. I have frequently told Brother Muth of them, and I have learned my bee-keeping from Brother Muth I will state this in reply to the gentleman from Tipton county: He may, if he understands the business, very readily succeed in getting 200 pounds of honey from a hive, provided he has a good season. There is no use for any of us to make statements of what we are going to do, because we can not tell how the season is going to be. The spring of 1880 our bees were in splendid condition, and everything favorable for a good crop of honey. About the 1st of June the weather became unfavorable and we got no honey. There was a general complaint all over the State, but it was nothing over which we had any control. We have had good seasons, and we hope the next will be a good one. The years 1876, 1877 and 1878 we had good seasons. In the spring of 1878 I had forty-seven colonies. My mode of getting the largest yields was simply this: I picked out four of my choicest colonies. I weighed every pound of honey that was taken from these colonies, from the 29th day of May up to the 10th day of July, the time the season lasted. From the first colony I obtained 325 pounds, from the second 310 pounds, from the third 298 pounds, and of the fourth colony I failed to keep an accurate account. These colonies did not have to build four square inches of comb. There were ten frames. There was honey below. The honey was taken out as soon as the combs were full, and they began to cap them. During harvest the bees were neglected three days, and the combs became solidly capped over. I think I lost fifteen or twenty pounds by not being there to attend to it. I took the honey out every four days. The best hive of comb honey made me 166 pounds, of their own building, no foundations to help. I know these statements of large yields are received rather doubtfully by a great many. I don't blame them for their unbelief. I never tried the plan of additional storing. I put on twenty frames for surplus honey.

Mr. Muth. That was when you had not time to remove the full ones. A large crop of honey can never be made except you have the season and unless your bees are very strong, and they will hardly ever be very strong if we let them go as they please. It is my management in the early spring to give them close quarters. I put the division board on each side of the cluster, so they may control their heat the better in order to hatch out their eggs. My division boards do not touch the bottom of the hive by one-half or one-third of an inch, so that the bees may go under the boards. In one of those frames we have a great many more bees without having any more frames. After these bees have commenced to hatch, and only after they have commenced to hatch, you have bees enough to spread your division board a little, and spread your frame, and give them another empty comb, and it will not be long before they will fill your frame again. You must not spread your frames too much. Young bee-keepers spread altogether too much, and the hives are injured more than benefited. Where do you put this extra comb?

Mr. Muth. If you have a queen in one comb, put them always next to them. In regard to the moth, he does not trouble me at all except if I have comb hanging outside some place in the garret or attic, I have to cover it up or else moth will get into it surely. In my bee hive there is no moth. There is no moth in any man's bee hive if he looks over it every once in a while, which every good bee keeper ought to do. If you do, the moth will be helpless. There is no trouble about it. It is a mere scarecrow.

The committee reported the nomination of the following officers:

For president, I. N. Cotton; treasurer, Mrs. E. Stout; secretary, Mr. Daugherty. Mr. Davis was instructed to cast the vote of the society for the officers nominated.

Whereupon, the president, Dr. Orear, declared them elected and called upon Mr. Cotton to take the chair.

Mr. Cotton. Gentlemen of the Bee-Keepers' Association of Indiana, you have taken me so completely by surprise, I have no speech on hand, and to manufacture one would be probably an uphill business with me. I shall not attempt to make but a few remarks to you. I have felt an interest in this organization, and have had some interest in bee-keeping in this State for a number of years. While I do not go personally extensively into bee-keeping, I propose to keep bees. Not for the benefit it may be to myself entirely, yet that is one object, but I wish to impart a knowledge of it to my children as they come up. Some of them may have a taste and desire to engage in it. While I have seldom reached over fifty colonies of bees at a time, I have made some money out of them. I shall endeavor to discharge the duties of the honorable office to which you have elected me, with energy and what ability I possess.

Mr. Sylvester Johnson, in a few well chosen remarks, eulogized the retiring president and complimented the treasurer elect and secretary.

The society then listened to a paper which was read by the secretary.

WINTERING BEES.

BY L. R. JACKSON, FAIRLAND.

Having been requested by the executive committee to prepare an article to be read before this convention, I have selected wintering of bees as my subject. It being impossible for me to be present, I wish first to make a few preliminary remarks. It is my desire that peace and harmony may prevail, and that the time spent here may be both profitable and pleasant, so that when the time comes to part, each and every one will feel that the convention has been a success, and that they have been well paid by being present. These conventions have done much to advance the bee-keeping interests. Where you find them most frequent you will find scientific bee-keeping making the greatest progress. In selecting vice-presidents great care should be taken to select men who will make an effort to organize county societies, so that by united action there may be more rapid advancement and progress. I am especially interested in Johnson county, as I will move there with my bees in March. Bee culture is fast becoming an important industry in this county, and if properly encouraged Indiana will fast take rank with the more thoroughly organized States. The reading of essays is of much benefit, but the greatest benefit is derived from the discussions following the essay. Errors will be exposed, and men will become less vehement in the defense of opinions still open to question, and more tolerant of the opinions of others. We should be polite and courteous in our criticisms. Let the argument always be with a desire to arrive at the truth. Test whatever looks like an improvement on your own plans and adopt that which proves good.

I have made wintering of bees a special study, knowing that unless we can be more successful in wintering we can never make bee-keeping a profitable business. Several things are essential to safe wintering, and preparations should begin early in the season. One of the most essential things is plenty of good honey as free from pollen as possible. Honey contains sugar in two forms, cane and grape sugar. Cane sugar is the most easily digested. Clover honey contains more cane sugar than the fall honey, and should be used for winter store. I always have frames in the upper story filled with clover honey for winter. These frames are set away until I pack my bees for winter. All preparations for winter should be made by the last of October. Bees should always be kept perfectly dry. Ice should never be found inside the hive. Bees should be kept from rearing broods in the winter. Much of the dysentery and nearly all the spring dwindling is caused by too early brood rearing. At least two old bees are lost for every young bee reared during the winter. I prefer wintering in a single wall hive on the summer stands. I know that a large majority of the bee keepers differ with me in this. Experience has taught me that there is more danger in bees becoming too warm than there is from cold. When the hive becomes too warm the bees become uneasy and consume a large amount of honey, start brood rearing, and unless they can have a good fly in a few days, dysentery will follow. Cellar wintering has never been a success, neither has double wall chaff hives. If the hive is kept dry and well ventilated bees in a single wall hive will stand any cold we ever have in Indiana, and there will be but little brood raised before the first of April.

I have prepared my bees for winter in the following way for the past five years, and during that time have not lost a single colony of bees, and have had but one that showed any signs of dysentery: I use a two-story single-wall hive, and the Gallup frame. About the 1st of October I remove all frames and sections from the upper story, and cover the bees with a quilt. About the 25th of October I set the upper story off, and remove the frames from the brood chamber to the upper story. I take three frames of clover honey and place in the center of the hive, and select five frames that were just removed, having the least polen in them, and place them on each side of the clover honey; spread the frame three-quarters of an inch apart, and put a tight-fitting chaff cushion on each side; shake the bees off of the remainder of the frame, in front of the hive, and put the frames away for spring feeding. Place two strips of wood an inch thick across the top of the frames, two and one-half inches apart; cover with a quilt, and fill the upper story with eight inches of loose wheat chaff. Do not use cushions in the upper story. Give a ventilation at the entrance of ⅜x2½ inches. The loose chaff will give plenty of upward ventilation, if the top does not fit too close. If it has an inch augur hole, it will be sufficient. Once in three or four weeks I tip the hive back, and brush out all the dead bees with a feather. I remove the top of the hive and stir up the chaff; leave the top off for half an hour, for the chaff to dry out. This work should be done very quietly, so as not to rouse the bees up. An average of eighteen pounds of honey is the most my bees have ever used, and twenty-five pounds is the most any one colony has used, and nine is the least from the time I pack for winter until April.

As much depends on the spring management, I will give a brief description of my spring management. About the first of April remove all frames, the bees do not cluster on. Take a frame well filled with pollen and place in the center, pass a knife over the honey to break the caps, close the frames up to one-half inch apart. This will cause the bees to fill with honey and create a general excitement in the hive, which will start the queen to laying. Brake the caps on other frames as fast as the bees will use the honey. When all the honey is used up remove one of the cushions and put in a division board that the bees can pass under, and place a frame of honey and pollen back of the division board, and brake the caps so the bees will carry the honey over. When all the frames are full of brood, spread them apart and put an empty frame in the center, and so on until it is built up to a full colony.

Mr. Muth. I do not see anything to criticise in that paper. It is a good paper, and I am glad it has been read and that it is going into our proceedings. He states that he gives his bees good combs, combs of good clover honey for wintering. I keep those very nice combs only for myself. I am sure that which the bees collect in the fall, even if a little cider is mixed with it, is just as good for bees to winter on as any they can get. If you lost bees, it is not from that cause, but from some other cause, from ventilation, probably. I used to be careful in early spring about cleaning out that little rubbish, until I found it to be a fact that this rubbish was composed of the gnawings of the comb, and was wax. If it was not wax, our friend's moth would not get in. I have seen the same thing in some of my hives occasionally; almost every bit of it is wax, and if we don't take it out, we will find that just as our bees progress and raise a brood they use these little particles of wax and carry them up and make caps with them. It is an assistance to them to leave this little rubbish; but leave it, and clean out the dead bees, they will smell and spoil the air in the hive.

Mr. Johnson. Will not the live bees carry out the dead bees?

Mr. Muth. They will carry out anything they can. We sometimes find a colony so weak, and dead bees so numerous, that it is quite a job, and we can do it with one sweep of a piece of glass two inches long; and it takes them weeks and weeks, during which time the air in their hives is pestilential and poisonous.

Mr. Peachy. He says in his paper that he believes as many bees die from too much heat as from too much cold. If there is anything about bee-keeping that I think I know more about than another, perhaps it is wintering bees. I have made a success of wintering bees. I don't believe more die from heat, if so all of our bees would have been alive—still, most of them are dead. We have had a great deal of cold and no heat. I put my hives in chaff from four to six inches, and plenty of chaff on top.

Mr. Peachy. In reference to the fact the gentleman from Tipton spoke of is nothing more than the cuttings of the comb. If you take it and clean it out you will see the bees carrying it back again. I hardly understand how it is the gentleman is bothered so with moth. If there is any one thing that bothers me least it is that. A strong colony of bees will take care of themselves. The gentleman in the paper mentions about bees wintering better in single wall than double wall hives. I don't believe that exactly. I am not able to tell in which hive they will winter best, but I have invariably found that those hives wintered best which had the most proper covering, which had been properly ventilated and where I had covered tightly they wintered poorest.

Mr. Cotton. You have to guard against any direct current, a draft through a colony of bees is undoubtedly damaging.

Adjourned until 1:30 P. M.

AFTERNOON REPORT.

Meeting was called to order promptly at 1:30. Mr. Scholl read a paper on "Preparing Bees for Winter."

PREPARING BEES FOR WINTER.

BY J. SCHOLL, LYONS STATION, FAYETTE COUNTY.

Friends and Brother Bee-Keepers:

With kind greetings to each other we have met again in this the opening month of the year 1882, to engage in friendly discussions, and learn from each other all we can in the various branches of our most interesting occupation. Although the winter and spring of the past year was a time of discouragement to bee-keepers in general, yet we see many around us who were not willing to give up the business, but with renewed efforts, and a determination to succeed, have regained what was lost, and with the experience of the past year, and well-directed efforts towards improvement in wintering, are better prepared than ever to prevent a recurrence of former failures. Even now, we have many things to be thankful for to Him who rules over all, and who is not unmindful of the interests of his creatures. Favored thus far with a mild winter, it is safe now to predict that our bees will hum in the joyous sunshine of a spring not many months distant.

Close observation for the past twenty years of the conditions necessary to successful wintering, has convinced us of the fact that bees suffer more from extreme cold in the beginning of winter than at its close, and that if cold weather does not come before the middle of January or first of February, they are comparatively safe. Why this is so we will not now try to explain. It can perhaps be accounted for on the same principle that governs plants and animals. It is a well known fact that fruit buds, and sometimes trees also, often suffer from extreme cold in November, when the same degree of cold in January or February will do no harm. There is a very important lesson to be learned from this, and that is, that we have our bees ready for cold weather long before it comes, so they can have a period of quiet and undisturbed rest from all work in the hive as well as out. It is very important to the well-being of a colony that sufficient time intervene between the gathering of its winter stores and cold weather for the moisture to evaporate and leave the honey thoroughly ripe. Late feeding to stimulate brood raising out of season, shortens the lives of the old workers, and if there is not a sufficient number of young bees raised to take their place, the colony is very likely to suffer should a long cold winter follow. We have invariably had the best success with colonies that were not disturbed in any way whatever after the 20th or 25th of September. In ordinary seasons brood is all hatched by that time in our locality. We are well aware that there is almost as much diversity of opinion with respect to wintering as there is in the construction of hives. But mere experiments in this direction are dangerous, and sometimes expensive, too. What the wide-awake bee-keeper wants is the improvement and perfecting of such plans and arrangements as have heretofore given the best results.

After some discussion, followed a paper by Dr. H. Peacher, on "Progressive Bee-Keeping."

PROGRESSIVE BEE-KEEPING.

BY H. PEACHER, MAYWOOD, IND.

Progressive bee-keeping, like all other progressive industries, has developed three distinct branches of bee-keeping—namely, keeping bees for honey, production and sale of bees, production and sale of queens; and the three are the outgrowth of only a few years' scientific bee-keeping. It has only been a few years since the only product of the bee was honey, polen, and more or less brood, and that taken according to Indian policy—"Take all you can; destroy and kill all left behind." That bee-keeping is profitable, is a question no longer of doubt by the intelligent reader, not only of bee journals, but of all agricultural papers. I am of the opinion that to keep bees profitably requires the selection of one of the branches of this industry, diligently pursued, and a perfect adaptation to the business, to which add patience and practice, with a genuine love for the business. I would impress it on the minds of all engaged in apiculture, that success depends more on the bee-keeper than on bees and hives. With all these requisites, 'tis necessary that we study our field well and observe closely, and having decided as to our specialty—let it be honey, bees or queens—certainly there is undeveloped trade sufficient to satisfy the most ambitious.

Honey has now become so much of a staple as to be regularly quoted, and has during the last twelve months ruled at fair paying prices, with a demand beyond the ability of producers to supply at this date. If we take an average good colony, valued at $8, by no extra effort on our part, and with fair average seasons, and no great amount of experience on the part of the apiarist, should yield fifty pounds of extracted honey, which at twenty cents per pound, gives us $10 per colony, and still we have the colony left for future services, while the fifty pounds was produced with a very small cost of money and time. I verily doubt if other stock of the same value can be found giving larger returns.

The production of bees exclusively for sale is a branch of the trade claimed to be more remunerative by those in position to know than either of the others; at least, we know that during the past summer there was heavy demands on those advertising bees by the pound, and which was no doubt largely caused by our very destructive winter. Yet, even up to late in the season, the demand continued strong, and bids fair to give producers all they can handle next season. I am of the opinion that we may usually expect one destructive winter in three, thus thinning out the ranks of the careless or negligent bee-keeper, and causing trade and dollars to flow into the hands and pockets of the prudent and careful. Then, should there be a production of bees beyond the demands of trade, we have the consolation to know they are neither an expensive or perishable commodity, but will pay their board bill as they go. Queen breeding is a branch of the trade requiring, perhaps, more care and judgment to succeed financially than either of the others; for to produce queens is one thing, and to sell them quite another. While to the breeder it certainly is a great source of delight and satisfaction to see the three-banded yellow queenly beauties, it is certainly equally gratifying to have orders waiting for the same. We would naturally be led to the conclusion that the supply was in excess of the demand, and yet during last season it was with the greatest difficulty reliable dealers could keep up with the demand; and I know of more than one instance in which orders and money sent in early in the season were not filled until late in the season, to the impatience and chagrin of the purchaser.

In order to give some idea, I will quote from reports of two queen raisers: W. Z. Hutchinson, in Gleanings, for January, 1882, says: "June 1st, 1881, found me the possessor of eighteen colonies. I have sold 263 queens." Now, as queens sell from $1 to $3, I presume we will not be far from the amount of his cash receipts if we say $1.50 each, giving the snug little sum of $394.50; and still Mr. Hutchinson has his original eighteen colonies, and some increase, I presume, also.

Again, I quote the Indiana Farmer: Mr. L. C. McFatridge says he, "from six colonies, sold 105 queens," and at our estimate of an average of $1.50, he pocketed $157.50, got 400 pounds of honey, and increased to twenty-eight colonies. Then, with this picture of a fair field before us, I see no cause for hesitancy or loitering on the way by those truly devoted to apiculture. I may be asked, If this be true, why not all rush into bee-keeping? or all keep some bees? To the first I would say that all are not suited to bee-keeping, have no liking for it, are not enthusiasts —which qualities I deem essentially necessary to successful bee-keeping.

That all could keep a few bees to an advantage, is just as plainly admissible as that all can keep a few hens to an advantage. The principal cause for not keeping bees is because the matter is not thoroughly understood, and the fear of being stung. Once get fully acquainted with their notes, and learn to handle them, and all this false and ungrounded fear vanishes. I have aimed at nothing more than a suggestion in these remarks, as each branch is worthy of a full and lengthy article.

After the reading a member asked to hear something about getting rid of fertile workers.

FERTILIZED WORKERS—THE BEST MANNER TO GET RID OF THEM.

Mr. Muth. I have had some experience with fertilized workers, and I think it an easy matter to straighten it up. The colonies of bees, as we all know, consist of a queen, drones and worker bees. The worker bees again have the work of the colony divided among them, according to their age, to the best of our observations. The bees are of age when about ten days old. When ten days old, they commence to fly out foraging and bring home honey or pollen, one or the other, or both, as the case may be; and the younger bees, if you observe closely, you will find to be organized workers, that build the combs and cap the cells, and do all that kind of work; and the younger bees are the ones that generally supply the larvæ in the cells with nursery food, as it is called. The old bees don't attend to any home work; the younger bees do it all. When we raise queens it happens very often that the old bees get tired of harboring them. If they have once been disappointed, the queens and all the eggs we give them will be destroyed, which is accomplished by the old bees and the fertile workers. The simplest plan is to supply that colony with young bees, and you can give them a queen at once, which will be accepted. I do it by taking a comb or two out of the hive, and putting in their place a comb with a hatching brood and adhering bees from a strong colony, and then introducing the queen. The lack of young bees in the hive is the only cause of their refusing the queen.

A Member. Mr. Muth is about right. Yet I do not follow his plan exactly I simply move the stand of fertile workers away ten or fifteen steps and put a new comb in the stand, and as the bees came out of the stand they went back to the new one and leave but a handful of bees in the comb. Then I reduce the queen's cell, and in a day or two there is a queen.

Mr. Davis. The worst thing I have had to encounter is bees robbing from one another.

The President called upon Mrs. Robbins to give her experience. She says: I have had some experience in robbing. I believe Bro. Daugherty's process is best. I have tried it successfully of putting hay, straw or grass in front of the robbed hive and contracting the entrance to it. It gives the bees in the hive an opportunity to escape and confuses those on the outside.

Mr. Rabb. I had a colony last summer that was robbed very badly, and when I found out they were coming out very rapidly I shut the hive for a little while. When I found where the robbers come from—from a strong colony, I simply changed the two colonies from one place to the other.

Mr. Peachy. I have been so fortunate as to have very little robbing. I have usually controlled what I have had by simply contracting the entrance, and taking some brush or straw and putting it in front of the hive so they will have a little trouble to get in.

Mr. Daugherty. I will say in reference to robbing, it hardly ever occurs unless we have a drouth and weak colonies. Prevention in all cases is better than a cure. But in spite of all that, we get careless once in awhile. We all get careless and give the robbers a chance, and it is almost impossible to stop it without removing the hive. If we contract the entrance it gives the bees on the inside an opportunity to defend themselves. I found two colonies that were robbing each other. I gave each a good strong frame of honey. They worked there for three or four hours, and when they quit I could not tell which had the advantage of the other.

Dr. O'Rear. I went to the lower part of my yard where the bees were and found they were being robbed. I got a bucket of water and threw it on them as they were getting to the hive. I did not drown them but gave them a good ducking. I went to my breakfast, and when I came out afterwards there was no more robbing going on. These fellows were crawling around in the grass drying themselves. They went home and attended to their business.

Mr. Rabb and *Mr. Davis* explained that they sometimes stopped the robbing by exchanging hives.

Mr. Johnson. I would like to ask whether there is any difference as to the frontage of your hives, whether east, west, north or south, and if there is any difference, which is the better point of the compass?

Mr. Beard. I prefer to face the east, because the early sun strikes them and they will get out a little earlier in the morning.

Mr. Davis preferred the east for the same reason.

A member preferred the southeast, because you get the sun longer.

Mr. Scholl. I would prefer to face any direction suited to the locality. For instance you have them near your dwelling and you want them to face away from your house, or away from any public highway, or from any path that is much traveled, or away from your garden, for this reason, that the bees in coming out of their hives will move direct from the entrance to their hives for a short distance. As for the hives facing east in order to induce them to come out early in the morning is a disputed question, as many bees are lost by the warm sun in the early morning shining in the entrance of the hive when the air is too chill and damp for them to get back.

Dr. O'Rear. I believe this convention agreed upon some technical terms. For instance, one member of this convention will talk about a queen, another about a hive swarming. Another will talk about bee stands. I believe a bee stand is a bench upon which the colony sits. That the hive is the habitation of a colony, the box in which they live and the colony embraces the queen and the brood in the hive, and the swarming of the bees is the bees leaving the hive.

Mr. Muth. Yes, I believe you are very correct indeed. I know that my hives do not swarm. I think it is of very small importance which way the hives face, whether east or south, I think there is not a particle of difference. If we face them east the sun strikes the opening first and the bees are very often induced to go out when they should not do it at all. If I had my choice I would have them face south, but I would take care to have them shaded in the summer. It is of much more importance to our hives. Our winds, especially the north-west wind is fatal to bees. When our bees go out in the spring air when it is cool, and the water is cool, and the little drop of dew which they collect is cool, and the bees start for home, they don't get there. It is much more important to our hives to have them protected from the wind. The apiary should be protected by a fence or trees or board. We find our hives turns out to be strongest when the honey season comes, when they can't get out excepting the weather permits.

Mr. Rabb. I prefer the east, and I protect the entrance. I do not like to have them west or north. I set something in front of them to shade them, and not induce them to come out.

Mr. Muth. As soon as the early spring is over it is beneficial, for it warms up the hive and makes the bees feel comfortable. For a like reason I prefer to have them in the shade in the summer time.

A Member. What do you think of house apiary?

Mr. Muth. I would not want a bee house that I have seen described by a number of our friends. If I would build a bee house my bees would stand twenty in a row, and the place closed in behind, with a roof over it so the stands would be dry, and boards for the hives to stand on so they would stand solid, and above the hives windows closed so that the sunshine would strike the window and warm up the place in which the hives stand. In summer I would take the windows out and take the boards off behind so the bees would be comfortable in the shade of the roof above them. If I had a place for my bees in my garden or yard, I would have them there, but I lose no more bees on my roof than any one of you do in your garden. My stands stand close together, perhaps only six inches between them, the tops just touch. I am sure I can raise a full quota of queens during a season, and my queens make no more mistakes in finding their proper homes than your queens do when your hives stand six or ten feet apart. They find their entrance hole just as easily, and more so with the working bees. I have watched the queen when she goes on a fertilizing trip she comes and runs over the portico as if she was trying to examine the whole outside of the hive. She flies off a piece and comes right back, say a half a dozen times, and then goes off further and comes right back into her hive. She keeps notice of the place where she comes from. She very seldom makes a mistake. They make a mistake once in a while. I have seen a queen alight in front of the wrong hive, and before I had a chance to catch her she went to her right hive.

Mr. Peachy. Is there any invention for controlling swarming? I have been prevented from getting considerable honey from the fact the bees would swarm more than I intended. It was not bees I was after it was honey, consequently I wanted to keep them in bounds.

Mr Robb. Give plenty of room for them to make surplus honey and plenty of room below for the queen to develop her eggs.

Mr. Daugherty. I have about made up my mind that it was impossible to control the swarming fever. If we are working for box honey it seems to me almost an absolute necessity to satisfy their propensity for swarming. I give them plenty of room, but when I am working for box honey they will swarm in spite of all I can do. I have been trying for years to control the swarming fever. I have given them room to stop it. It wont do it. I have had them swarm out of the hive when they have had plenty of room. They had the propensity to swarm and it must be satisfied. It is better to have all the colonies swarm as early as possible before the honey harvest comes, even then they will sometimes swarm in August.

Mr. Muth. When bees swarm they do it because they are over-crowded, or crowded in some manner. We all know that the old bees are honey gatherers, and the more we can retain them the more honey we will get. I am certain that our bees swarm because they are over crowded, but if you wish to get a full crop out of them you must not give them too much vacancy in the hive, and keep filling up gradually.

Mr. Potts. I put in comb honey and brood, and still they went.

A Member. Clipping the wings of the queen, is my plan.

Mr. Muth. It is the habit of quite a number of our friends to keep their bees out in the orchard or in an open place where the sun shines. The sun shining on the hive makes them warm, and you generally put in a comb after you see they intend going. It makes no difference, they will go. The bees must have a comfortable home. You must keep your hives all the time in the shade, in a cool place. Your hive must be cool when you put your swarm in. When you put your hive where you want it to stand, have a bucket of water ready and sprinkle it over the bees gently, they will think it is raining and go in very nicely.

Adjourned *sine die.*

DOMESTIC ANIMALS.

WHERE THEY COME FROM—THEIR INTRODUCTION INTO EUROPE.

TRANSLATED FROM THE GERMAN IN POPULAR SCIENCE.

In the early time, when the tribes of the Indo-European people still formed one undivided folk in its Asiatic home, the sheep and the cow had already been tamed. This is proved in the case of the sheep by the numerous varieties existing among them. The word daughter, which means "the milker," and which is common to all the Indo-European languages, bears witness to the early taming of the cow. Of both these animals, man at first used only the milk, the flesh and the skin. Afterwards the cow became man's assistant in agriculture. It was not until a much later time that the horse took the place of the cow, at first chiefly in traveling and in riding, afterwards more and more in agricultural operations. Here, however, arises the important question, whether the people already possessed these tamed animals when they moved into several parts of Europe, or were they first received by them at a later time.

There is no doubt that the original home of the horse is not Europe, but Central Asia; for since the horse in its natural state depends upon the grass for its nourishment and fleetness for its weapon, it could not in the beginning have thriven and multiplied in the thick forest-grown territory of Europe. Much rather should its place of propagation be sought in those steppes where it still roams about in a wild state. Here, too, arose the first nations of riders of which we have historic knowledge, the Mongolians and the Turks, whose existence even at this day is as it were combined with that of the horse. From these regions the horse spread in all directions, especially into the steppes of Southern and Southeastern Russia, and into Thrace, until it finally found entrance into the other parts of Europe, but not until after the immigration of the people. This assumption is, at least strongly favored by the fact that the farther a district of Europe is from those Asiatic steppes, *i. e.*, from the original home of the horse, the later does the tamed horse seem to have made its historic appearance in it. The supposition is further confirmed by the fact that horse raising among almost every tribe appears as an art derived from neighboring tribes in the east or northeast. Even in Homer the ox appears exclusively as the draught animal in land operations at home and in the field, while the horse was used for purposes of war only. Its employment in military operations was determined by swiftness alone. That the value of the horse must originally have depended on its fleetness, can easily be inferred from the name which is repeated in all the branches of the Indo-European language, and signifies nearly "hastening," "quick."

It was chiefly by reason of these two properties—fleetness and courage—that the horse quickly became an animal without which history would seem barren enough. Without the horse neither the expeditions of an Alexander, nor a migration of tribes nor a Christian knighthood, would have been possible; in a word, without the horse, all those mighty movements which have shaken the world and have stirred the very foundations thereof, could never have been thought of; and the people, sitting still and silent upon the ground, would never have left their accustomed boundaries to go forth fighting and colonizing from land to land.

Happily the horse possessed still other important properties which rendered possible its employment in other than warlike uses. Chief among these properties are its sagacity, endurance, and fidelity. When, therefore, war was no longer the chief employment of Europeans, and agriculture had taken its place, man soon thought of employing the horse as a draught animal as he in like manner had hitherto used the cow. Then did the horse become, for the first time, of real use to culture, and a leading actor in it. Such had not been the case in Asia up to this time. The ox had drawn the plow and wagon but lasily and slowly, and agriculture had made slow progress; but with the horse came a new impulse, a higher purpose in this occupation, which made it an important and valuable one. Even to this time the horse, by reason of his excellent properties, is regarded as the truest companion and aid of man in all the operations as well of war as of agriculture. Neither is this noble animal to be forgotten in commerce and trade, nor in art; in a word, it is the most valuable and therefore the best treated domestic animal which Europe has to exhibit.

Besides the horse, some other animals, which in the pastoral time had not yet entered Europe, soon made their appearance. They were the ass, with its near relative, the mule, and the goat. All these wandered, as did the vine, fig, and olive, from Asia Minor and Syria to Greece; and, strange as it may seem, the mule preceded the ass, whose original home may, after all, have to be sought for in Africa. Both spread at a later date from Greece into the same regions in which the vine and the olive found their way, and for a time did not pass beyond these regions. For, notwithstanding their patience and contentment, by virtue of which they are satisfied with the most wretched food, they did not find the climate in Northern Europe a hospitable one for them, and are both still really strangers there.

The goat, too, on account of its predilection for young trees, buds, and sharp, aromatic herbs, can be kept in great numbers only in those regions in which the injuries inflicted by them are of relatively little importance. It therefore feels more at home in the rocky labyrinths of the Grecian islands, Sicily, Sardinia, and Italy, than in the northern regions. According to the census, Italy in 1863 possessed forty-one million goats.

Of four-footed animals, Europe has received only one further addition—the cat. Unlike the dog, it was most probably not a primitive companion of man, but is relatively a late gain. The taming of the animal is a fruit of the religious customs of the Egyptians, who recognized the worth of this mouse-destroyer, and permitted divine honors to be paid to it. Its picture, therefore, meets us beside other wonderful figures upon numerous Egyptian monuments, and in the tombs whole layers of cat-mummies are sometimes to be found.

The ancient Greeks were not acquainted with the cat, but the mouse was certainly known to them from the earliest period—a fact shown by the name which is common to all the Indo-European languages, and which signifies apparently "thief,"—and they not seldom suffered so severely under the plague of these pests that whole regions were devastated and as a consequence had to be abandoned. For the destruction of the mice they used either the weasel or the marten, which were tamed for this purpose. The weasel, especially, held just the same place among them that the cat now holds among us, and it passed in like manner into proverbs and fables.

Among the Germans this animal was allotted to Freya, whose carriage was drawn by two cats. At the same time it was regarded as a shrewd, magic-working animal, and it therefore played a leading part in matters of witchcraft, during the middle ages, besides the owl and the bat, in myths that grew plainly enough out of its sneaking movement, its preference for the night, its dark fur, and its eyes, which glow in the dark. Cats guarded secret treasures in mountains and caves, they lay at cross-roads at night, they carried on their operations in ruined mills in the forests; even witches and magicians assumed their forms in order either to inflict injury upon others or to visit the Blocksberg. The German fables of animals allot to the cat the prize for wisdom and deception. When it becomes necessary to bring the robber Reynard to court to make an end of all his evil deeds and the complaints arising therefrom, and Brown, *i. e.*. Bruin, the bear, has failed in the attempt, then it appears that only Harry, the cat, is able to accomplish the task of delivering the artful message to the evildoer. Again, the cat does not lack certain desirable qualities. How burdensome does the dog with his caresses often become, how unskillfully does he exert himself to please; how gentle and amiable, on the contrary, can the cat be, how pleasant its manner and motion. During the middle ages, therefore, the cat served as a plaything for distinguished ladies, who nursed it on their laps and fed it dainty bits; and at the present time, among many persons. the cat finds recognition and love.

PROCEEDINGS OF THE FARMERS' INSTITUTE,

Held at Columbus, Bartholomew County, Indiana, March 8th and 9th, 1882, Under the Auspices of the Indiana State Board of Agriculture.

During the annual meeting in January, the State Board of Agriculture made arrangements for holding a series of Farmers' Institutes at various points in the State. Columbus was selected as the place for the first one. The meetings were held in the large north room of the Court House. Among those present were Governor Porter, Prof. R. T. Brown, Dr. T. M. Stevens, and J. J. W. Billingsley, of Indianapolis; Henry Meredith, of Cambridge City, President of the State Board of Agriculture; Mr. Alex. Heron, Secretary of the State Board of Agriculture; Professors Wiley and Ingersoll, of Purdue University, and C. L. Whitney, of Cincinnati.

The visitors were met at the depot by quite a large number of citizens, and conveyed in carriages to the St. Denis Hotel, and were afterward driven to the Starch Works before going to the place of meeting. Soon after 9 o'clock the throng began moving toward the Court House, and in a short time the room was well filled, and soon the crowd was such that standing room was scarce.

PROGRAMME.

WEDNESDAY—MORNING SESSION.

10:00—Welcome Address, by Judge N. T. Carr, of Columbus.
10:30—Response on Behalf of the State, by Governor A. G. Porter.
11:30—Address, by Professor C. L. Ingersoll, of Purdue University.

AFTERNOON SESSION.

1:30—Lecture, by Professor H. W. Wiley, of Purdue University. Subject, "Commercial Fertilizers."
2:30—Lecture, by Mr. H. Doup, of Columbus. Subject, (one of his own selection.)
3:15—Opening the Question Box.

EVENING SESSION.

7:00—Lecture, by Hon. J. B. Conner, Chief of the Bureau of Statistics. Subject, "Source and Value of Statistics."
8:00—Lecture, by Dr. T. M. Stevens, Secretary of the State Board of Health. Subject, "Sanitary Measures."

THURSDAY—MORNING SESSION.

10:00—Lecture, by R. T. Brown, of Indianapolis. Subject, "The Mutual Dependence of all Branches of Industry."

11:00—Lecture, by J. J. W. Billingsley, editor of the Drainage Journal. Subject, "Farm Drainage."

AFTERNOON SESSION.

1:00—Lecture, by Prof. C. L. Ingersoll, of Purdue University. Subject, "Breeding and Feeding."

2:00—Lecture, by C. L. Whitney, of Cincinnati. Subject, "The True Dignity of the American Farmer."

Local Committee—S. R. Quick, Chairman; T. A. Moore, Secretary; M. J. Quick, Treasurer.

Promptly at half-past nine o'clock, S. R. Quick called the institute to order by saying:

Ladies and Gentlemen:

This is the first of a series of institutes to be held in this State. I have the pleasure of introducing to you Judge N. T. Carr, who will deliver a short address of welcome to the people.

JUDGE CARR'S WELCOMING ADDRESS.

Mr. President and Members of the Farmers' Institute of Indiana:

Delegated by the local committee to speak on this occasion for our people, it is with a pleasure unfeigned and a willingness unsimulated, for them and in their name I extend to you a hearty and sincere welcome among us.

We are pleased that our thriving city should have been selected as the place of your meeting, and proud that our industrious and prosperous farming community should have been honored with the first meeting of this newly formed institution, and that they should be the first to receive the many benefits which must necessarily follow the course of instruction marked out by your programme.

Again, we all unite in welcoming this initiative meeting of an institution which has for its aim and object a universal diffusion of that knowledge which is especially adapted to our agricultural classes.

In taking this step for the advancement of education in that direction, the State Board of Agriculture have inaugurated an institution which, if properly prosecuted must be pregnant with results that shall cause its founders ever to be remembered with gratitude by those who will receive through this action untold benefits and unlimited blessings.

The day is not far in the past when it was universally agreed that the farmer needed no further education than would enable him to multiply the number of his bushels by the market price, and no more skill than that which had been acquired from a limited personal experience, and transmitted, in all its crudities, from sire to son. Even the day is still upon us when it is quite as universally supposed that no other educational acquirements are needed by them than barely to read and write, and poorly master the four fundamental rules of simple arithmetic, and, if perchance, or by force of pride, a farmer's boy is educated in a high school, it must be to fit him for some of the less laborious avocations of life; while nearly all unite in the error of thinking that colleges and universities are useful only in the manufacture of Doctors of Divinity, Doctors of Law, or Doctors of Physic.

How few of our farmers realize that their vocation is one, which to reach the height of, requires knowledge of a greater number of the sciences taught in our highest and best institutions of learning, than any of the learned professions.

I doubt not, that while this last sentence dropped from my lips a contradiction struggled for utterance in one-half of this assemblage. Yet a moment's reflection will confirm the truth of the assertion. Let us examine:

The lawyer, as such, deals only in that particular branch of learning. The physician may confine himself only to the properties of medicinal mediums, of the origin of which, or preparation, he may know nothing, and to their effects upon diseases, the causes of which he need not seek, while the Doctor of Divinity may be required to familiarize himself with the words of Scripture and peruse the pages of a late commentator only. True, either of these classes would be greater with larger and more comprehensive minds, and shine the brighter in the community in which they live, just in proportion as they acquaint themselves with other branches of learning; yet within the limit first named, most of them manage to make the round of life, and the rest is but polish.

To them, as such professional men, astronomy is nothing, for the eliptic, the equinox, the solstices and the elipsis of orbits, change not their seasons. To them geology is nothing, for their soil is neither alluvial nor lime deposit. To them meteorology is nothing, for the climate has little to do with their products. And so throughout all the range of the sciences.

Yet this is not so with the farmer. From the opening of spring to the close of winter, at every step in the prosecution of his business, he encounters on every hand, at every turn, that, which either in the heavens above or on the earth at his feet, to successfully master, control or manage to their best possible results, requires of him a knowledge of celestial or terrrestrial nature, that embraces all the sciences and sources of learning known to man.

To demonstrate the truth and illustrate the full force of this proposition, let us single out a few instances of the thousands that crowd in upon his consideration and demand intelligent action.

His time, indeed, has no beginning, yet for our present purpose we will begin in the early spring at the moment when he is called upon to determine his course for the coming year. He has two underlying objective points in view: First, to leave his acres at the close of the year as valuable as they now are, and second, to make them yield as great a profit as possible, consistent with his first consideration. In this light he takes a survey of his fields with the view of determining which of them would bear planting at all, and if so, then in what they should be cultivated to yield the greatest per cent. of profit proportioned to the labor and expense required. With no other knowledge than that which he has gained from a few years of limited personal experience he may leap to a conclusion, but this conclusion will be uncertain and unsatisfactory in direct proportion to the number of existing facts and conditions which have been omitted from his considerations, or certain and satisfactory in proportion as he has intelligently weighed the natural elements which his enterprise will be compelled to encounter.

It is known by scientific demonstrations that certain given crops require a certain degree of soil-heat to insure their full development; hence the average heat of each field should be ascertained by accurate tests, and this fact applied to a scientific knowledge of each grain which it is contemplated to plant. Therefore, the theory of heat as learned from natural philosophy must be known. Again, certain productions require a given amount of lime to insure their success; hence an analysis of the soil of each field should be made, and the facts developed applied to the chemical condition of the desired production. An examination may disclose the fact that an idle field, which should be cultivated, is excessively charged with carbon, sodium, or with magnesium, in which case such a crop must be selected as in its growth will most absorb these elements. Or such an examination must assure him that a given field, which he had contemplated to cultivate in grain, is so devoid of phosphorus that the plan must be abandoned, and something else must be sown instead. Indeed, such an intelligent examination of the situation may require that much, if not all, of the farm be put in grass, and the raising of grain be superceded by grazing or by dairy farming. Or it may be disclosed that a field or fields, which it had been contemplated to cultivate, must be fertilized before it will repay the expense of even plowing, in which event he must understandingly choose from the various fertilizers that particular one which, more than the others, contains the element most wanting in the soil. Whether it shall be compost, guano, bone dust or plaster, he can only determine by a knowledge of what elements are most needed in the soil, and what are contained in the material inviting use. Nor will such an examination for one spring suffice for any other, as each successive season changes to a large degree the chemical condition of the soil.

True, all of these natural elements may be disregarded, and the farmer strike wildly at a course of action which will have its results; but these results, as I have said, may not be the best that could have been attained by a knowledge and careful consideration of the natural causes thus encountered.

To be assured of the highest, and therefore most profitable ends, the farmer must be a chemist. Indeed it will be seen that without a knowledge of chemistry he is prosecuting his business at random, and at the mercy of causes, whose existence are unknown to him.

Having determined upon planting a given field, with a given grain or crop, the next question presented for his determination is: When shall he plant? Shall this question be answered by the former practice of the father? That practice may not have been dictated by intelligence, and hence, while it may lead to a correct result one season, it may prove disastrous in the next, which so far differs in time and climatical phenomena. Shall it be answered by the supposed superstitions or signs which hover about, or one made apparent by the moon?

Indeed, is this planting of certain crops in the dark and others in the light of the moon, a superstition only, that will mislead and betray its votaries into losses, or is there in truth that in the reflected borrowed light of the moon which at their earlier or later stages injures some and benefits other crops.

That there is that in sunlight which will facilitate the growth of crops at some stages and blast it at others we know; that there are many unfounded superstitions still entertained in reference to our satellite we feel assured; and to know—to act intelligently upon this subject, we are required to be learned in all the phases of the moon, their causes, and chemical, as well as climatical effects. These things we can not know without first learning something of the sun and the earth. Nor can a reliable knowledge of these be attained without understanding the relations of all the planets as developed by astronomy. Without a knowledge of this branch of learning the farmer must act without a guide in determining the time when the soil shall be prepared, and the kind of seed be planted.

Thus it will be observed that this branch of learning is of vastly more importance to him than to any of the professional men I have mentioned.

But it may, and often will occur, that the soil in heat and composition will be quite equally adapted to either of two different crops, in which event a selection should be determined from the relative advantyges of each in the next year's market. Here an intelligent conclusion can be reached only by a knowledge of supply and demand in the comercial world. In this the farmer should have a knowledge equal to that possessed by the members of our boards of trade in all the metropolitan cities. This, too, is a branch of learning which calls upon the farmer for constant attention and which can not be safely ignored by him.

Having determined what and when to plant, he must then consider the purchase of the instruments to use for this purpose, as well as for the purpose of harvesting the same. To make an intelligent selection he must have a knowledge of mechanics. To depend upon the vendors subjects him to imposition, annoyance and often to loss. He, himself, should be as competent to judge of its adaptability as the most skillful artisan, and should therefore understand the full force of mechanical powers and their development, the comparative strength of materials, and the philosophy of its construction.

Here, too, he is concerned in the price of these instruments, as well as the price of such materials as be needed both in the field and in the household. This concern requires him to know whether this price is at its intrinsic value, or whether a fictitious or unnecessary one has been foisted upon it by the assistance of the law making power, over which, in this country of ours, the farmer should have a control equal to that of any other class of citizens.

To know this fact he must be conversant with the principles of political economy .and the science of government. The principles and effects of direct and indirect taxation, through custom or import duties, should be as familiar to him as his right to property.

If in the imposition of import duties the law makers have adopted a principle which is inimical to the interest of the farmer in determining the price of the commodities he is compelled to purchase, while in no wise counterbalancing in regulating the price of the products he sells, it becomes his duty to intelligently understand and universally oppose the principle.

For the past twenty years the federal law making power has legislated on this subject upon the principle of protecting such interests as were engaged in the manufacture of commodities, many of which the farmer is necessitated to buy. This principle increases the price of every yard of textile fabrics which are taken into his household, as well as every implement taken into his fields, while the law in no manner advances the value of the prices of such products as the farmer places in the open market of the world, unprotected from competition. Thus the agricultural industries are taxed for the benefit of manufacturing ones.

To render this unobjectionable it is argued that in building up such manufactories where a great number of men are employed who must be fed, the farmer's market is thus increased and his prices enhanced, which, it is said, indirectly compensates the farmer for the taxes he is compelled to pay under the operation of such principle.

Whether this conclusion be true or whether it be false is a matter of the highest importance to every farmer, and before he can intelligently determine its truth or falsity—those principles affecting the question of political economy should be known to him as thoroughly as any other branch of learning.

Also, when a crop shall have been raised, harvested and made ready for sale, a new interest opens up to his consideration. It now becomes important that he should be enabled to reach the best market at the least possible expense; and as these markets are often on the sea board, to reach which requires a transit through different States and over different railways, the right of State or Federal governments to regulate inter-State commerce, and the respective powers of these corporations to regulate and control their own terms, becomes questions in which the farmer should be as learned as he is concerned.

Thus it will be admitted that our farmers must be politicians. But here again it is of vital importance that they should be so learned as never to degenerate into mere partizans, who are such slaves to party that they vote its ticket regardless of the principles it carries into execution.

Permit me to utter here an unpleasant but a painfully prominent truth. The neglect of our farmers to educate themselves in the various branches of learning, and especially that of political economy, has permitted the political parties of the country to become controlled entirely by men who either have no interest of any kind to foster, or who are concerned in monopolies only, and who shape their course to subserve that purpose which yields them the greatest amount of money, while farmers blindly follow them, although it may lead them diametrically opposite to their highest individual interests. We trust the day is not distant when he shall possess that knowledge which shall enable him to participate in the counsels of political parties, and control, to a certain extent, their policies and their principles.

It would grow tedious for me to follow further, for the purpose of illustrating how his should be one of the most learned professions among men. Though strongly tempted, I must refrain from showing how, in the selection and management of his soil, he should be an expert geologist; how, in the care and control of his stock he should be a naturalist, and how, in its development, he should be learned in the principles of evolution.

An institute like this which you have inaugurated will largely add to the store of knowledge among our adult population while it will inspire the father to educate his sons, not for doctors, lawyers, preachers or clerks, but to give them the highest possible collegiate education, that they may become competent farmers, and that avocation become the most learned, as it will then be, the most respected of all the pursuits which now engage the industry of our people.

Proceed, then, to the noble work which lies before you, nor tire, nor stop until the furrow has been broken in every county in the State, and the beneficent seed planted in the breast of every man and woman who live by tilling the soil. It is a new and auspicious era whose sun should not set until its light shall illumine every community, and whose beneficent breezes should fan into life and energy powers which have been sleeping for ages. Every appearance gives us hope, and encourages our anticipations. Inaugurated by the State Board of Agriculture, aided by the learning of Purdue University, and supported by His Excellency, the Chief Magistrate of the State, it can not fail of grand moral and intellectual results that shall stamp their impress upon the age and bring forth a future so bright in promise that the present and the past shall seem dark in its brightness.

Welcome, then, thrice welcome to our midst, our hearts, and our hospitalities.

Governor Porter was then introduced and addressed the people on behalf of the State.

GOVERNOR PORTER'S ADDRESS.

Ladies and Gentlemen:

It gives me pleasure to respond to the salutation of the State Board of Agriculture, given by you in such cordial terms on behalf of the citizens of Bartholomew county, who have opened this large hall and their larger hearts to give welcome to the board. Many persons might have supposed that a county in which nature has been so prodigal in bestowing benefits—a county whose soil is unsurpassed by any in the State—would, in comparison with others less favored, have felt little interest in agricultural meetings, where the questions chiefly to be discussed are, how soils may be rendered more productive or preserved from deterioration, and the best way of saving what usually goes to waste. You have shown how intelligence has kept pace with your increase in wealth by offering a higher inducement to have the first institute under the auspices of the State Board, held in your county than has any county in the State.

The duty of the State Board to hold agricultural fairs each year is devolved upon it by law, and it has discharged that duty well. But that is not the most important of its duties. It is required also by law to meet each recurring January to consider the conditions, the wants, and the prospects of agriculture throughout the State. To do this requires inquiry, observation and study.

The State has also, let it be said to its credit, an agricultural college, with plenty of warm, young blood in it, in which the most interesting questions relating to agriculture are studied—soils analyzed, the merits and properties of grains and other products tested by careful experiments and analyses, and attention given to many things relating to agriculture which farmers in their busy fields have not leisure to consider.

It has been thought by the Board and by the college that they could do a good service to farmers, and not less to themselves, by more immediate communication with the people; by imparting to farmers their best knowledge, and receiving in return from farmers the valuable knowledge derived from observation on their part in their fields, from their thoughts at the fireside, and from their intercourse with one another.

It is in pursuance of this belief that this Institute is held here to-day. It is to be a free conference. No man's opinions are expected to be authoritative. Every question is to be laid bare for debate. Two of the professors of the agricultural college are here. They are learned men. Their attainments are known outside of the State as well as in it. They are farmers' sons. For years their lights have shone far into the night while they have been studying many interesting questions relating to agriculture. But they do not ask you to accept what they say unless it shall commend itself to your thoughtful judgment, and they invite you to test its correctness by inquiry, and, if you please, by opposition. And they expect to return to their college not without having learned a good deal from you.

I have never for one moment since I have been governor of the State, felt so satisfied with my position as I do to-day in the presence of this vast assemblage of citizens, met to consider the interests of agriculture. It is creditable to you to be here. The county is honored by your being here. The prosperity of the agricultural class is at the basis of the State's prosperity. The pyramid rises from this base.

The farmer should be hospitable to thought. From every direction he is deriving profit from it.

Every improvement in the means of transit brings him profit by cheapening the price of transferring his products to the great markets. The steel rail has produced a revolution in railroad transportation. It costs but about a fifth more than the iron rail, and it is nearly imperishable. It diminishes vastly the expense of maintaining railroads. It increases the capacity of transportation. It allows greater speed. It enables railroads to transport persons and freight more cheaply. The adoption of it and the wholesome competition resulting from the continued multiplication of railroads is reducing, in spite of all combinations, the cost of transportation of all farm products. With whatever injustice railroads have attempted to maintain too high rates, reductions have become inevitable. More will come. A bushel of wheat is now carried from Chicago to Liverpool for twenty cents. What would it have cost to carry it from the one place to the other twenty or even ten years ago?

Whatever renders the market more certain tends to increase the price of a farmer's products. Men do not have so much to take the element of risk into account when making an offer. The telegraph now informs us daily of the state of the growing crops and of the market value of agricultural products all over the world.

The telephone—that wondrous time-saver—will soon be a profitable servant to you when existing patents shall run out, or a more enlightened sense of self-interest shall sharpen the sight of greed so that it will perceive that by diminishing present prices it will soon be far more than repaid by an increase in the number of its patrons. It will enable you to avoid the trouble and expense and loss of time of many a trip to town, for you can make a sale of your products, or make purchases, or call your doctor, without going to town at all.

You are deeply interested as farmers in whatever will increase the productiveness of your soils; or will lessen the cost of production through improved implements or by diminishing the cost of them; or will enable you to dispense with expensive buildings, or expensive fences heretofore necessary; or will save your crops, when ripened, from injury by exposure to the weather; or will diminish the trouble and cost of selling them or of their transportation to market; or what is extremely important—and which I wish to dwell upon more particularly—increase the price of your products, whether vegetable or animal, by multiplying the uses for which they are employed. All these things are of great interest to you as tending to determine the profitableness of your occupation. The thought of many minds in many occupations has been of inestimable service to you on all these questions, and will in the future be of no less service than it has been in the past. It is such questions as these that the State Board and these professors are constantly considering. Men skilled in such questions could entertain you by discussing any of them. I shall myself refer to but one or two.

It is interesting to consider what an increase has been effected in the productive capacity of the soil by underdraining and by a judicious rotation of crops. It has been discovered that the admission of air into the soil is as necessary to it as is the admission of air into the lungs to give vigor to the human system. The tile-maker supplies the soil with lungs, which enable it to inhale the atmosphere; the benignant clover, when its roots decay, thus rendering the soil porous, does the same thing. The air transforms the properties of the blood; it transforms the soil also, by dissolving its mineral constituents and enabling them to be appropriated by plants and by depositing in the soil some of its own fertilizing properties. If you stand several days on wet earth so that your feet are daily soaked, you will grow sick and your physician will say you are suffering from malaria; if the roots of a plant are soaked in like manner it will grow sick also, and the chemist, who is the physician of the soil, will say it is for the same reason. Each doctor will advise his patient to keep more out of the wet. When you sit in a close room dejected and feverish, some one will in a chance way raise a window and the fresh air will restore you; it is just as important to plants to open windows into the soil. Underdrainage and the rotation of crops, where they have been practiced, have in this manner increased the productiveness of soils from twenty to fifty per cent.

But what I intended to dwell upon a little at length, as being somewhat more novel, is the profit arising to the farmer—chiefly through the use of chemistry and invention—from new uses to which his products have come to be applied.

The most interesting instance, perhaps, that can be cited (though, of course, it does not affect Indiana farmers,) is the new uses of the cotton plant. From immemorial time that plant has been cultivated, without its having been suspected that the cotton seed possessed any valuable properties. It has recently been ascertained that the seed can be applied to many valuable uses. The oil expressed from it, after being purified by some inexpensive process, sells universally as the olive oil of commerce. It is most extensively used in the manufacture of soap, of all grades, and is likely, nearly, to supersede in the manufacture of that article the animal fats. The superintendent of a large public institution told me a few days since that soap for laundry purposes used to cost the institution three dollars a barrel, but that now, in consequence of the use of cotton-seed oil, it costs the institution but eighty cents a barrel. It is used also, after having been solidified by a cheap process, as a substitute for lard, and a gentleman in Indianapolis, whose wife is, I know, an excellent housekeeper, told me a few days since that she preferred it in cooking to the genuine hog's lard. It is used, I have been credibly informed, in the manufacture of butter, and when thus manufactured is distinguishable from any but the best butter only by the fact of being better. It is also used as a lubricator and in the manufacture of paint. The oil cake is used as a provender, and is shipped to every part of the world. These many and varied uses of cotton seed must enhance the profit of the production of cotton.

Indian corn is now used extensively in the manufacture of glucose, though that industry is merely in its infancy. From 25,000 to 50,000 bushels is now manufactured into glucose daily. The glucose is converted into a choice syrup, and is exceedingly attractive in appearance. In its taste it resembles more than any other sweet the maple syrup. A honey is manufactured from it that is not distinguishable in taste from the honey of the bee, and both in a liquid form and in a comb manufactured by some artificial process and undistinguishable from the bee's comb, is sold most extensively as bee's honey. It is also extensively manufactured into candies and jellies, and has begun to be manufactured into a wine which none, it is said, but a connoisseur can distinguish from wine produced from the grape. In the production of starch, the use of corn is widely increasing. The invention of machinery for a cheap production of hominy has prodigiously increased the manufacture of that article, and from having before an extremely limited sale, it is now being shipped as food to Europe, Mexico and South America. A flour is manufactured from the starchy element of the corn, by a process of double grinding. The husks of the corn grow more and more in use in the manufacture of mattresses. The silk of the corn, manufactured into a syrup, is used most successfully as a specific for diseases of the kidneys. The multiplying uses must tend constantly to increase the profitableness of its production.

The new process for the manufacture of flour has, by converting a much larger part of the grain into flour, and improving the quality of the product, added at least ten cents to the value of every bushel of wheat. Fall wheat has lately been found to make a better article of flour than spring wheat, and Indiana wheat is held in special esteem in all markets.

The syrup of the sorghum cane has been ascertained to be as susceptible of granulation, with as little expense, as the Southern cane, and the syrup has been cleared of that taste which impaired its palatableness and nearly destroyed its commercial value. So that, for producing sugar, the use of sorghum cane is a new one; and for producing syrup, the quality has been so improved as to render the use of this cane for producing syrup almost equivalent to a new one. The seed, ground into a flour, is sold as buckwheat flour. Professor Wiley, who will address you upon this subject, has made the sorghum cane a specialty in his studies, and is not surpassed in intelligence upon the subject by any person in the country.

A process of drying fruits has been discovered, as you all know, by which the drying is done so promptly that fermentation is avoided, and the natural juices of the fruits are retained instead of being allowed to evaporate. The palatableness of the fruits is thus greatly enhanced, and their use much augmented. Potatoes are treated in like manner, and in their desiccated state preserved from disease and shipped extensively into climes where before their use was unknown.

I might mention other vegetable products for which new uses have been found, which tend greatly to augment their value.

But what shall I not say of animal products? How great a part of the swine and the bullock is now used which not long ago was cast aside as useless, and, indeed, as a nuisance; and how greatly have these new uses increased the price of these products. A few days since I was taken, while at Chicago, by Mr. P. D. Armour, of the great slaughtering and packing house of Armour & Co., through their establishment, the most extensive, I believe, in the world. I was so impressed by what I saw, and especially by the utilization of those parts of the swine and bullock which used to be regarded as worse than waste, that after I got home and began to think a little about what I should say to you to-day, it occurred to me that it would be well to address a letter to that firm containing inquiries upon this latter and most interesting subject. I accordingly did so, and with a frankness and courtesy characteristic of that enterprising house, they replied to it promptly and fully. If it be your pleasure, I shall read the letter to you:

"CHICAGO, February 24, 1882.

"*Governor A. G. Porter, Indianapolis, Ind.:*

"DEAR SIR—We have your favor of the 20th inst., and are pleased to be able to give you such information as we can, respecting the operations of our packing house, etc. It will be impossible to give you such full details in this way, as we should be glad to give you in a personal interview; but should we not cover any special ground that you wish to cover, we hope you will indicate such deficiency and we will very gladly supply it.

"We will say that prior to 1855, hog's hair, which is now a well-known article of commerce, with an annual largely increased demand, was not saved at all, but is now carefully preserved; and, after proper treatment, meets with a strong and extensive European demand at prices which well repay the labor and care bestowed upon it. The entrails also were regarded as valueless prior to 1858, since when, having been carefully preserved and prepared for sausage casings, the demand, both foreign and domestic, frequently exceeds the supply, the very large consumption of sausages, in this country as well as abroad, taking them as fast as they are cured and ready for delivery. The bladders, as you are doubtless aware, form an important and valuable item, being used for many purposes; chiefly, we think, for putting up lard, the size being portable and popular. The pig's heads are now utilized in the manufacture of head cheese, an article very generally dealt in by butchers, both in city and country, and which is now supplied to them by many of the packers. Pigs' feet, tripe, trimmings of all kinds are carefully preserved and utilized to the best possible advantage, the season of the year and other circumstances being considered—which to give in detail would be not only difficult, but uninteresting, but which form factors, as to value, of much importance.

"The improvements in rendering lard, which are comparatively of recent date, are among the most important items which may be cited as adding increased value to the aggregate product of the animal. The old custom of rendering in open kettles has now been practically abandoned, and the more approved method of rendering by means of steam pressure, has become almost universal. It has been definitely ascertained that, by the latter treatment of the lard tissue, the fats are more completely extracted, and much very valuable product formerly wasted, and therefore valueless, is now saved to the consuming world as well as to the manufacturer.

"The ox-tails and kidneys have been largely enhanced in value within a comparatively recent period, being now used in the manufacture of the soups bearing their respective names, and being in large and steady request both at home and abroad. The great improvements in the machinery for the manufacture of these soups have rendered the production of these palatable and nutritious articles of food a matter of comparative ease, when skillfully handled, and as all the product of well-known and standard factories may be relied upon now for care and cleanliness in preparation, the demand for these goods is rapidly and very largely increasing.

"Tongues, both ox and pigs, are now preserved and their natural value increased by being presented to the public in a cooked form ready for immediate use, and, in this shape, forming one of the most popular and desirable products of the canning establishment.

"The blood and tankage, which for many years have been absolutely valueless, and, indeed, worse than this, having been a tax to the extent of cost of removal, are now the source of continued and important income. The valuable fertilizing properties of these articles make them active competitors of the natural phosphates and ammoniates dealt in on the seaboard, and their lately increased value —arising from comparative scarcity—adds greatly to the receipts of all manufacturers.

"To recapitulate somewhat, we would say, that the hair and bristles are worth 10 cents per hog; the blood when dried and prepared, worth, say $50 per ton; and the fertilizer, say $30 per ton; bladders, 1¼ cents apiece; and taking everything together now saved, which was formerly absolutely wasted, we may say that, in our own business, the amount will not fall short of one million dollars annually. This enormous saving has been effected by the adoption of improved means of handling all our product, as well as by the exercise of such ingenuity as has been brought to bear upon it, in the discovery of new modes of treatment and of the best manner by which it may be utilized.

"We are sorry not to be able, in so long a communication, to give you full and special details respecting many of the matters alluded to, but we shall be glad to give you any further items of interest that we can, upon application.

"Yours truly, ARMOUR & Co."

What is the effect of the saving of all this material that was previously thrown away? First, to increase the profits of such great establishments, but ultimately to increase, to nearly that full measure, the value of hogs and cattle to the farmer.

And now, farmers, what is the high significance of all this? It means that you should be hospitable to science, hospitable to invention, hospitable to experiment, hospitable to thought, come from what quarter they may, for they all bring advantage to you.

I thank you for the interested attention you have bestowed upon these remarks from one who, unlike yourselves, is not a farmer. He spent, however, a part of his life on a farm, and can sincerely claim to feel scarcely less interest in your occupation than yourselves. I regret that pressing official duties will prevent my attending the sessions of the institute longer than during to-day. I trust, however, that the sessions will abound with interest and be productive of benefit not only to agriculture in this rich and hospitable county, but to agriculture throughout the State.

AFTERNOON SESSION.

The choir sang:

> We are sowing, only sowing
> Seeds along the life's highway.

After the song, Joel S. Davis, Chairman, introduced Prof. C. L. Ingersoll, of Purdue University, who spoke in the main as follows:

PROFESSOR INGERSOLL'S ADDRESS.

I propose to say something in regard to industrial education. The origin of the thought that farmers ought to have some education, originated among the mountains of Switzerland as late as 1825. To-day we have Purdue University—it is called aside from this, "The Indiana Agricultural College." In this college you have three courses. First, the Agricultural course; second, the Mechanical course; third, the Scientific course. These three courses run nearly parallel to one another till they reach a certain point, and they then converge. The student in the Agricultural course has first placed in his hands a work on vegetable physiology. He has a microscope put into his hands, and taught how to use it. Then he takes up landscape gardening; and then the speaker proceeded to relate how the student would be initiated into the various subjects which it is the object of this course to teach.

Then, again, we come to the Mechanical department or course. Here he is instructed in regard to wood, its properties, etc., and the various forms into which wood is shaped. He proceeds from the simplest operation—viz., the sawing of a board crosswise, and then by and by to a plain box, then to the dove-tailed box. They then pass on to turning, to the making of patterns in wood; and while on this point, the Professor exhibited several specimens of turned work—a wooden goblet, a wooden pattern wheel, etc.

IRON WORK.

They go to the forge. The first thing he does is to draw out a five-eighths piece of iron rod, and make it a three-eighths; then reverse this operation and make it a five-eighths again; then the bending, then the chain. After this, work in steel; the chisel, oil and water tempered. This is not theoretical or uncertain, for the tool is put into actual use. This is going on at the University this very afternoon.

After this work comes another class of work in mechanics which is called bench work in filing. And this bench work commences with the simplest elementary principle as before.

The professor then exhibited a specimen of the lathe work in iron. To illustrate the practical utility of this college on the farming class, the professor said: I have before me farmers who are living from eight to ten miles from town. Accidents are apt to happen when you are least looking for them, and just at a time when you are pinched the worst. If you have a son educated at Purdue, the boy will fix the bolt in less time than you can go to town to get the work done. I have thus tried to show you that this matter of an agricultural education had its birth in a land of freedom; that it is being carried on by men who feel the need of more education, and this very feeling has established universities of this character. Will now give way to Prof. Wiley, and thank you for your kind attention.

DISCUSSION OF ADDRESS.

Dr. R. T. Brown. I would like to ask Prof. Ingersoll, when it was that Michigan established her agricultural college. I believe that was the first school in the United States.

Prof. Ingersoll. In 1857. That is, I said in my address it had its inception in 1849, but not established till 1857.

Mr. Quartes Moor. Have you experimented with Russian oats?

Ans. No, sir. I expect to do so this spring.

Ques. Have you ever tried the value of oats sown in the fall?

Ans. No, sir. I believe that in this climate spring oats are better for us.

Prof. H. W. Wiley, of Purdue University, being introduced, addressed the Institute on the subject of commercial fertilizers.

PROFESSOR WILEY'S ADDRESS.

You see a plant growing vigorously, and you may think that it takes everything from the soil. In point of fact, what the plant takes from the soil would not probably average more than one per cent. of its bulk. Much the larger quantity comes from the air and water. The part that the soil does furnish, is that part which is left on burning it—that is, the ash. Therefore we should direct our investigations to the ash. The ash of the plant contains two essential ingredients. 1st, potash; 2d, phosphoric acid. Therefore, since only these two elements together with ammonia come from the soil they should be restored to the soil, and are the things we should look for, especially in a commercial fertilizer. Then followed a close explanation of the chemical analysis of these three elements. Every box of whatever kind of fertilizer that is offered for sale in Indiana will contain these labels, as fixed by law, showing the relative proportions in the mixture of these several chemical ingredients. In regard to the value of these substances, we are required to furnish to some agricultural paper published within the State the result of our analysis of these fertilizers. The Indiana Farmer contains the result of this work, so that any farmer can see what any fertilizer is worth.

Ques. Prof. Ingersoll: Is there any difference in the range of field with regard to the use of the fertilizer?

Ans. Yes sir.

Ques. State on what these are based.

Ans. Will give the Georgia method up to 1874. The ammonia was reckoned at 18½ cents per pound. The insoluble phosphates were estimated at 42 cents per pound. Potasium at 6¼ cents per pound. Then the professor gave the estimate in same State in 1876.

The Ohio price is, for ammonia, 17½ cents; insoluble phosphates 6 cents per pound. One fertilizer he mentioned was the Blood and Bone Fertilizer, manufactured by Peter Henderson, of New York. Another by Charles E. Hall, of Indianapolis. Estimated value of first, $40.24; the second, $44.10. These prices are all found on the labels. Another is called the "Bone Dust," manufactured in

Chicago, $22.67 per ton. Another, "Bone Meal," manufactured by Peter Henderson, New York, $44.07 per ton. Another, the "Garden City Super-Phosphate;" estimated value $29 per ton The labels have the name of the manufacturer and of the fertilizer itself on them, so that you can identify them at once. Governor Porter mentioned in his address that the refuse of the slaughter houses was made into fertilizers. Now there is nothing so valuable to the farmer as the bones. Most of these fertilizers contain bone dust. Bodies of all animals that die in the city should be saved. Some animals, like some persons, are not worth much till they die. Vast improvements have also been made in the manufacture of lard. The Governor forgot to say that the crackling is one of the most valuable of substances for fertilizing, because it is so rich in nitrogen.

Another point: the great fineness in which it is presented. There should be two kinds of analyses. First, mechanical analysis; second, chemical analysis. Then the lecturer went on to remark on the tediousness of the process of analysis; that parties sometimes brings fertilizers to his office and even want to wait while the analysis is being made. To show how tedious is the process, he observed that he had made some seventy analyses which embraced about 210 days' hard work.

The first object of the statute bearing on the subject of fertilizers was to secure the farmer a genuine fertilizer, such as is indicated on the label.

Ques. Can any farmer who wants a fertilizer analyzed send it to you and have it done?

Ans. If they would send a half-dozen we could do it. The trouble is we have so many sent us and it takes so long to make the analysis.

Ques. But if there are only a few?

Ans. Yes, sir. I expect to occasionally make them. There was just three different varieties of fertilizers examined. First, pure bone meal; second, superphosphate; third, ammoniated fertilizers. You can tell by your label which one you are getting.

The speaker here concluded his lecture and indicated his willingness to answer questions, but no one being ready with any questions, the chairman announced that the query box would be opened.

Query. What is the advantage or use of land plaster?

Ans. It is of use to soils deficient in lime and sulphuric acid.

Ques. After the crop has made itself, will it injure the land?

Ans. There is nothing in any of this that injures the land.

Ques. If you add too much land plaster, will it injure the land?

Ans. Yes, sir; just like adding too much lime.

Ques. How would you advise the use of bones?

Ans. From a factory here in Columbus.

Ques. What is the value of salt on ground?

Ans. From the chloride of soda which it contains.

Ques. Will limestone ground or pulverized very fine be of any advantage?

Ans. Yes, to any soil deficient in lime. Different crops of course require different fertilizers. Wheat has a large amount of phosphoric acid in it. Therefore fertilizers which contain a large amount of phosphoric acid would be good for wheat.

Ques. How will a farmer know what kind of fertilizer he needs?

Ans. Try a little.

Ques. There is an impression that clover is the best natural fertilizer. In what particular is clover deficient as a manure for general crops?

Ans. Clover works in two ways—chemically and mechanically. Clover is valuable in that it keeps the soil porous.

Doup. In turning under a heavy clover sod, and planting corn after that, it takes what we call the "yellows." What is the cause of that?

Answer by Ingersoll. I should think it owing to the mechanical rather than chemical effect.

Ques. What is the value of insoluble phosphate of lime?

Ans. In Georgia they count it nothing at all.

Ques. How can you make it valuable?

Ans. By gradual disintegration.

Ques. Do you decide that it is better to plow corn stalks under than to burn them?

Ans. I do.

Jake Cook. Don't you think it would be a good plan to rake and burn the stalks to get rid of the insect eggs?

Ans. Probably it would.

Cook. Hadn't a fellow better keep sober while using one of these rakes, to keep from breaking his neck?

Ans. I should judge that it would be better for a fellow to keep sober under any circumstances.

Mr. Henry Doup was next introduced, and spoke as follows:

MR. DOUP'S ADDRESS.

Mr. Doup disclaimed against his undertaking to deliver a lecture. We have heard questions discussed to-day which perhaps the ordinary farmer could not understand. Why? If we look back over the past age we find that the farmer's education has been too much of one kind; too much education of the muscle, and there is where the trouble comes in. What a vast amount of labor has been performed since the colonial days! And it has all been done by the hands of the agriculturist. It was the necessity which grows out of our existence that drove the red man out of our forests. The virgin freshness of the soil has departed with them. When our forefathers were hewing down the trees, the question of the chemical analysis of the soil did not enter the mind. The farmer knew that when he got the trees down, that soil would yield him a bountiful crop. But the fertility of the soil has gone, and to-day we must address ourselves to a careful husbanding, and restore the soil to its original fertility.

After calling attention to the character of the topics, calling for discussion on the programme, the speaker said:

I want to say to you to-day (because it would be more proper for me to say it than any of our visitors to say it) that the American farmers stand at the foot of the class intellectually. Why is it, tell me, that in the Senate of the United States there is not one single farmer? Why is it that when your conventions are called no farmer is called upon to address the public? Is it because he is not interested? No! Where do we stand? We are here to-day from curiosity. Will we come here to-morrow from the interest we feel? Lawyers have their bar associations; merchants their boards of trade, etc., all having in view the advancement of the interests with which they are identified. But the farmer stands upon the same ground. He is to solve the same problem, viz: How shall I be clothed? It is imperative that the farmer should not only understand the mysterious workings of nature, but all questions taught in the schools, designed for the agriculturist. I tell you we are on dangerous ground if we continue on in the paths that have been trodden in the past. Farmers' natural talents are just as good as any body's else, but the cultivation of these talents is what is needed. I saw a picture the other day—a picture of railroad kings, among whom were Jay Gould, Commodore Vanderbilt, Sydney Russell and Cyrus Field. To-day they weigh more than every farmer in this State. They are shaping the legislation of this land. Why? Because they have taken a keen interest in the vocation in which they are identified. Mark me, if the farmer continues down at the foot, he will find himself the loser in the long run.

There was a brief time allowed for questions.

Ques. What kind of soil most needs fertilizing?

Wiley. You can't tell except by experimenting.

Ques. Professor Ingersoll is asked how to destroy potato bugs, and answered: After they are planted put Paris green and land plaster on a few times.

Ques. How do you apply it?

Ans. By means of a sprinkler. There were some machines manufactured which a man carries upon his shoulders by means of a strap.

EVENING SESSION.

About seven o'clock the bell of the court house called together the few dozens of persons who cared to venture out in the threatening storm. As soon as all had been seated, Mr. S. R. Quick introduced the next speaker.

STATISTICS AND ITS IMPORTANCE TO THE PEOPLE.

BY HON. J. B. CONNER.

Three years ago the Legislature of our State passed an act which created the Indiana Bureau of Statistics, and the first annual report was issued in April, 1880. Previous to that date no one could tell much about the resources of the State, the growth of its industries or its growing commercial advantages, except as they waited long and patiently between decades for the census reports. The changes which are now wrought by the genius of our people in the methods of our industries, and which more and more accelerate our achievements in all directions, make this waiting from decade to decade seem—and really is, compared with our former modes of life—a half century. We are really developing and growing in thought and activity more now in ten years, than we used to grow in fifty. That we have outgrown the census is evidenced by the establishment of Departments of Statistics in nearly all the thrifty and enterprising States of the Union. Everywhere men are asking for facts, for these are the basis of all well-directed, intelligent activity. Previous to the establishment of our Statistical Bureau, with its annual reports, the various departments of State were wholly without data for answering the numerous inquiries from the countries of Europe, whose teeming and industrious populations were seeking new homes among us. We could afford little information in regard to our resources and capabilities, in response to the people looking this way from the older States. The General Assembly of our State met and adjourned without having before it collection and classification of facts throwing light on subjects of domestic legislation. We knew little in regard to our own State outside of a very small circle; and these few facts were fragmentary, unclassified, and, therefore, frequently misleading. A great change has taken place in three years in Indiana, in this respect. Her statistical reports, embracing facts in regard to our resources in agriculture, manufacturing, mining and commerce, now go annually to the great industrial centers of Europe, as well as those of our own country. They are placed in all our township and county libraries and all public offices, for reference by the people of our own State, and are furnished to our legislative bodies. Now, instead of waiting for the decade reports of our productions, every intelligent citizen may know, before the end of each calendar year, what and how much of everything we produce, and be able to right his own affairs for the coming year thereby. More than that: commencing with the coming month of April the Bureau of Statistics will each month, on a given day, in every township in Indiana, ascertain through the one thousand and eleven trustees, the acreage and condition of the growing wheat, rye, timothy meadow, clover, and pasture grass, and the outlook for fruit crops, etc. These facts will go at once to the people through the newspaper press of the State At great expense to themselves large operators in our grain productions are constantly, during the crop seasons, hunting up these facts in order to take advantage of and profit by them. The producing classes themselves should also be in possession of the facts, that they may have the advantage due them. I do not allude to these things in a boastful spirit, but for the single purpose that the methods and purposes of the Department of Statistics may be known.

The law creating the department requires reports on such lawful subjects as the Bureau may ask for, from over three thousand public officers acting under oath. To the Bureau, more than three times the number of officers are required to collect and report facts, than are employed by the Census Bureau during the time that department is at work. They are the equal of the class of men, as to intelligence and capabilities, that are employed by the Census Bureau, and therefore the facts ascertained and reported by them are as much more accurately reported as their number exceeds those employed by the Census Bureau. It is well known that the less the number of facts given to classes of officers to report upon, the more accurate are their reports. The one thousand and eleven township assessors are required to make investigation upon two questions, viz: acreage and production. It is true that they have more than one hundred and fifty inquiries, but they are all cognate questions. These officers return their answers, on blanks provided, to county auditors, a very intelligent class of officers, who are required to review and tabulate the facts ascertained, and report them by townships to the Bureau of Statistics. In the fall season blanks are sent out to the one thousand and eleven township trustees, and they are required to report production per acre, condition of live stock, etc. Other officers are required by law to report on such other questions as may be asked. The law also requires railways, manufacturing corporations and companies to make reports on such questions as may be propounded in blanks and sent to them for that purpose. All city and town officers, city town and county boards of health are also embraced in the law among those required to report on such questions as may be asked by the Bureau. To each class of officers —where the inquiries lie nearest their other official duties—are apportioned the several classifications, so that the several classes of facts come from those who are most familiar with them. All these facts are classified and tabulated by the Bureau in such way as will suggest deductions therefrom, the culmination and final purpose of statistical work.

The science of statistics had its origin in Europe in the eighteenth century. Prussia, France, Sweden, Belgium and other leading countries of Europe now have well organized departments searching for facts, comparing and deducing from these new principles in all departments of activity. The organization of the work in the United States is now going on in almost every State, in one form or another. From the middle of the eighteenth century to this day classes of men have been shaking their heads and asking the question: "What is the use of statistics, anyway?" The simple and plain things require the most time for explanation, and like the lexicographer, who takes a page for the definition and interpretation of monosyllables, those who realize the usefulness of statistical science must continue their explanation. But as nothing succeeds like success, the best answer and explanations are statistical tabulations of facts which become as palpable as mathematical solutions.

More than a hundred years ago there was a tract of five hundred acres of land which yielded immense and profitable crops of staple production. The owner of it became wealthy, and when he died left it as the patrimony of an only son. The methods of industry of the father also descended with the farm to the son. But the productions of the farm grew less and less, till the son became a subject of neighborly charity. The over-piously inclined friends about him said this was Providential dealing toward their neighbor, and it was for a wise purpose—that this was the meaning of the failure of his crops, and they comforted him with advice of pious resignation. One day a man came along who had a bent of mind for facts, and who had some love for and knowledge of chemistry. He asked the impoverished farmer how many crops of given kinds had been grown upon his land, and what had been returned to the soil for all this. Putting down the answers and learning that no element had been returned to the soil, he consulted some of the statistical works of a noted Prussian scientist and found that a given number of crop productions had in a great number of cases cited, exhausted the soil of its potash, or lime or magnesia or other elements. He advised the experiment on a small scale with some of these elements added to the soil. It was done and the land produced abundantly again. Resorting to his mine of these elements, where all were combined in his barnyard—and other sources of supply, the impoverished farmer soon began to learn that the formula of his over-pious neighbors was not the best solution of his troubles by any means.

A hard providence indeed, is our ignorance; but if these light afflictions which seemeth not joyous, but grievous, shall work the peaceable fruits of more sense for those who are exercised thereby, a blessed providence indeed is it after all. That farmer is a type of a million others all over the world. With such practical solution of his troubles, by the man of facts, this one ceased to shake his head, or ask —"What is the use of statistics, any way?" Such illustrations stand as an answer in the concrete to the inquiry.

It can not always be definitely determined what good may result in the collection and classification of facts, which is the work of statisticians, any more than the judge of a court can tell how a cause may terminate while the evidence is being heard; but the facts and evidence reveal the true relation of things; and it is found to be wisdom to trust as many facts as can be collected and arranged. it is always in the discovery of new facts by the classification and manipulation of old ones. We do not know in advance their precise value, but, do know that only such States and Nations as avail themselves of every avenue for the collection and classification of facts make rapid advancement in civilization and material prosperity.

In a further specific view of the subject it may be said that statistical facts enable us to determine approximately the prices in the future, and settle the question whether to hold produce or sell; what kind of crop is most likely to bring the best returns in next year's market; whether to buy supplies now or in the future; to approximate a uniform price of labor; to give us a knowledge of public expenditures and teach principles of public, as well as private economy.

In 1879, the farmers of the United States, as statistics show, produced 448,756,630 bushels of wheat, the home value of which was $580,486,217; while in 1875, they produced 292,136,000 bushels and yet received $555,445,930. By these facts we see that the smaller crop of 1875 was but 65 per cent. of that of 1879, yet the value of the small crop was over 95 per cent. of that of 1879. So these statistical facts reveal the truth not generally accepted, that frequently short crops are blessings to the producers. The wheat crop of Indiana in 1879, was about 44,000,000 bushels, and its home value was $45,000,000. The wheat crop of Indiana for 1881, was a shorter crop, being 30,626,668 bushels, and yet its home value was $41,650,908.

Carefully collected vital statistics in Massachusetts show that the average age at death of 28,000 farmers was 65 years, while that of 123,000 persons of all classes was but 51 years. The lives of the wives of farmers were found to be much shorter, and defects in the sanitary surroundings of the home, such as cess-pools, hog pens, etc., were found to be the causes of this. And thus statistical science by the collection and comparison of facts, have an important bearing on health and longevity, and suggest the necessity of improvement of the surroundings of the home. Another illustration of its importance, right at hand, may also be mentioned. During the year 1881, finding a single township in Indiana which was rather level, and until recently without tile drainage, the department of statistics instituted an investigation to ascertain the effect of drainage upon health.

A period of five years before tile drainage, and a like period of five years after such drainage was selected. Physicians who had during these two periods practiced their profession there, attending all who required medical services, were requested to consult their books for the data respecting the number of cases of disease caused by malaria. It was found that for the first period of five years, before tile drainage, there had been 1,480 cases of such sickness, and during the second like period after drainage there had been but 490 of such cases. Similar collection of facts, have over and over shown like beneficial influence of the tile drainage upon production.

The mission of the statistician is to produce the raw materials—the facts from which the scientist, statesman, political economist and philosopher, may deduce substantial principles which become the basis of the best civilizations. Neither the one, nor the other can know with any certainty the true lines of thought and action, except by the comparison of classified truths, bearing upon the subjects in hand. How shall National and State legislation proceed with intelligent direction, when members of these bodies have no access to the facts bearing upon the subjects which shall come before them for action? No one who will, with some degree of patient thought, study the systematic collection and classification of facts upon health, commerce, agriculture, education, manufacturing, mining, criminals, etc., etc., will ever thereafter ask—what is the use of statistics?

SANITARY RULES AND REGULATIONS, OR HEALTH, WEALTH AND COMFORT.

BY DR. THAD. M. STEVENS.

Sanitary science is of greater significance and importance than is generally admitted, and the application of sanitary rules and regulations in general.

In the city, where individuals crowd together—where the cess-pool, privy vault, sewer, etc., are of necessity in close proximity to human habitations, and the domestic animals necessary for commerce or traffic, or subservient to the pleasures of the citizens, are housed next door to his own domicil, it is generally admitted that in such places, and under such circumstances, some attention should be paid to proper inspection and control of conditions and material that may be detrimental to the health and lives of the citizens.

It is not alone in the city, however, but in the country also, that care and attention should be had regarding such conditions and materials. The "tangled wild wood," the "meadows where the violet grows," and the fields of waving wheat and corn has, by the poet and the poetic sentiment inherent in all persons, been held as emblematic of places where purity dwells, and where renewed health and vigor is to be sought and found. And as such scenes are beautiful, and health and vigor may often be attained by the frequenter of such places; but "country health" is no more certain, as contrasted with that of the city, than are country morals. Difference in forms or sources of disease, as well as forms or sources of temptation, may be and are found as we consider either in city or country. But disease and death are common to both localities, as are sin and misery likewise. Time will not allow a long talk to-day. We shall speak strictly with reference to the application of sanitary rules to country localities. Let us shortly consider—

First. The financial aspect of the question;

Second. The influence that the adoption of sanitary rules has on the health and lives of the inhabitants.

Third. The influence such rules exert toward the comfort and health of the live stock on the farm.

First. When we traffic and sell certain articles of produce, receiving the money therefor, we can not only readily calculate the profit derived from such sale, but we experience at once a sense of financial gain.

When we by economy save expenses, we often realize that such economy is painful and demands self-denial. We do not directly receive money, but we know from experience that we retain what we have, and at the end of a certain time we have the same amount at deposit in bank as though we had received it direct by traffic. This knowledge reconciles us to practical economy.

If any one were to tell us that many thousands of dollars per annum could be certainly made in an increase of amount of, or price for the produce of our live stock or grain, by using certain definite means, we would with enthusiasm strive to use such means.

The actual loss by sickness in consequence of preventable disease is a loss to the individual who is sick, and to his family and dependents. It is also a loss to the State as compared with other States whose sick list from such cause is less; also, it is an actual loss to the State in proportion to the amount of taxes lost by the State in consequence of failure of such person to pay, or else the State, to make it up, will have to increase the amount of taxes of those who are well. All these facts hold good with reference to those who die of preventable disease each year, and even if we say that to the individual deceased there is no loss by his death, still as the loss to his family and dependents is increased by such death, the actual loss may be counted the same. In each county of ten thousand inhabitants there is lost in this way $80,000 per annum. That alone makes the subject of health laws and their observance desirable; but if we examine we shall find that a week's sickness costs each one thus afflicted a certain sum, that to himself and to the community in general there is an actual loss, besides the actual cost. Let us see for a moment. If persons are sick they can not earn support; rather they cause expense to one or more; they are unproductive consumers, and as health and disease are not only absolute but relative, there is a gradation from perfect health to absolute helplessness.

The following figures are taken from a reliable source of statistics, showing the number of deaths in England from preventable diseases, and the cost and loss to the State and citizens in consequence of such deaths. The figures given are for one year:

Deaths from preventable diseases	25,000
One-third of those were adults	8,333
For each death twelve cases of sickness is computed	300,000
One-third adults	100,000
Each death (adult) is computed at $1,000	$8,333,000
Each adult sick for six days in the year, losing $2 per day	1,200,000
Each of the cases of sickness cost 80 cents per day for six days	1,440,000
Total cost and loss per annum	$10,773,000

Add to this the cost of funerals, etc., and the sum would be swelled to about $12,000,000.

Now let us make a like estimate for each county in the State, and for the entire State.

Place the average population of each county at ten thousand, making the calculation upon the same basis as the above estimate was made, we find that the average number of deaths from preventable diseases to be at least two per thousand inhabitants.

Deaths in each county	200
One-third for adult death	66.66
Multiplied by $1,000 (estimated value) of each person	$66,660 00
If 200 die, 2,400 are sick, one-third adults, 800, at a loss of $2 per day for six days, this would be	9,600 00
The 200 sick would not only be a loss, but it would cost for attendance, etc., an average of 80 cents a day for this six days	960 00
Total	$77,486 00

Multiply this by 92 (number of counties) and we have to be saved by the State $7,128,712.

That is the amount that might be saved to the State of Indiana and its citizens each year, and this does not include death or disease from epidemics, etc., but is calculated upon the rate of mortality from the usual diseases that are prevalent each year, and this calculation is upon the basis of about one-half of the real population of the State.

This amount would build your State House in one year, and leave two million to be divided among the several counties of the State, each county receiving about $200,000, enough to provide in good style for county asylums, or enough to build and equip one or two State hospitals, that is absolutely demanded for the accommodation of the sick of the State, and as a means of relief to county asylums so that room and accommodation could be given the real needy and meritorious poor who, alone, should be housed at such asylums.

This amount, you must keep in mind, is a low estimate for one year. Let it run three years: we had out of the first year built the State House and suitable quarters for the accommodation for the sick of the whole State and a balance remains at the end of three years of $14,208,480.

"What shall we do with it?" is the question now, not "Where shall we obtain the money?" Do the figures appear large? In fact they are not large enough and we lose more than enough by sickness, and death from such sickness, that could and ought to be prevented to place the whole State in the best possible hygienic condition within three years, and one thousandth part of such expenses would thereafter keep up and add to the work.

All this is so plain that it surprises us. If we are told that with equal certainty the same amount of money could be saved by following the directions and details of sanitary science and the rules of public hygiene, we sigh at the barren prospect and idly say "that is too much trouble."

It is a beneficent law of nature that often a good result is obtained by man's work being prompted by varied motives, so we find that in the interest of agriculture, in our strife to obtain a larger and better return from our fields and stock we are led to use such means that, in the long run, surely aid at least in improving the sanitary condition of ourselves and our stock, thus two results, viz: the increase in kind and quantity of agricultural produce, and the bringing about of the greater comfort and health of the citizen and his live stock, both so intimately blended that the one can not be attained without, in a large degree, carrying the other along with it. nor yet can one be curtailed or injured without similar ills befalling the other.

You ditch and lay your drain tiles for what purpose? To relieve the water-soaked ground and so that vegetation shall be more healthy and more luxuriant. The yield of all that grows is increased, the profits are increased in like manner, but what more is the result? The fog, that formerly settled to the too cold and moist ground is found there no more; the chill that you or your live stock felt every evening or morning, no more clogs the emunctories of your bodies or shock your nervous system—the vivacity of health is found in both man and beast where apathy or torpor existed—you no longer have to take your "bitters" (quinine) in such frequent or large doses, nor do your cattle go with the same downcast head, moping as they go, the cow gives more and better milk, the blue has left it and gone to the sky, the butter is better in quality, and where you used to look upon such in like color, "mother of pearl," you now see what delights every true housewife's eyes, and what always brings the money in, a solid, well tasting lump of slight saffron hue.

It is in such localities that the poets lived who wrote glowing accounts of life, and in such places life can indeed be enjoyed with profit.

It is the same in regard to our attention to live stock. We wish to have them so that they shall yield a profit; we therefore feed them better, of more nutritious substances. We are taught by experience that if they are protected from the storm, comfortably housed, kept clean—even hogs—that in some way the net profits of the final yield is greater. We therefore are assured by the promptings of gain to do that which sanitary science and the rules of hygiene directly dictate and demand. But while this is the general rule, viz: that what we do in the direct interest of agriculture and to increase the productive power of live stock, tends to the fulfillment of the laws of hygiene, still we should keep an eye directly upon such hygienic rules—for often while we work to mend one object we fail in the others—for instance: we safely and closely house our cattle, and even our hogs are attended to so that gain may result. No brewery slop is given them, and the running brook or well-kept reservoir supplies the water for all stock, but the house that shelters us, the well from which we drink, the cellar—what of these? The house may or may not be ventilated. If it is, it is by natural ventilation no doubt, viz: through the cracks and crevices in walls, under and around doors and windows, etc. If the house has no such cracks or loose-fitting doors or windows, then in fourteen cases out of twenty it lacks ventilation. In summer the air may be changed by way of open doors or windows, except at night. In the winter, the air imprisoned and befouled, finds no way of escape, and the pure outer air moves around the dwelling where the deadly coal or wood fire glows, desiring but finding no way to enter to the relief of the inmates that are being slowly poisoned to death.

Do you wish to know how typhoid fever attacks the family? Why headaches, nervous prostration, billious attacks, foul breath, sluggish senses and "letting down" of the vital forces are so general? Why in the morning you often desire to lay in a sluggish sleep when everything calls you forth? Why your bones ache and you go early to bed and late to your breakfast? You will not believe me. You will say, "Because I caught cold driving in the cows," or "because I worked so hard, became heated and then chilled," or "because I ate that pork and cabbage last night." No doubt you could be and often are injured in either of these ways, but eight cases out of ten you are "off the track." None of these things are apt to hurt unless there is trouble to commence with.

The poisonous organic matter eliminated from the lungs and skin of the family and imprisoned in the sitting room, together with the carbonic acid, etc., breathed over again and again, poisons the blood, benumbs the nervous centers, stops or clogs the action of those glands and vessels whose duty it is to take up effete matter and cast it out, which remaining, is as subtle a poison as prussic acid.

And the cellar. What have you stored there? "Vegetables." They may be rotting, or if not, giving off in their changing condition gases and solids that percolate through the cracks of the floor and between the outer and inner walls of the house, rising as is their nature to the upper portion of the house, so that you had better live in the cellar than above if you wish to escape the deadly poisons from such sources.

Then the water. Do you use a cistern? No filter; or if one, such as will catch and retain the filth that lies soaking in the water soon to be used; but if a well, where is it? Within one hundred feet of a privy vault or stable yard, where, in kindness to your stock, you have cast the stable offals? We know the poet writes about the "old oaken bucket" that held that which was better "than the nectar Jupiter sipped," but we do not belive he had a well in view such as here depicted.

You drain your land by laying your tile horizontally. This is well, but you might as well drain it by digging a number of wells in different parts of your field. A well is nothing but a drain placed perpendicularly. If the water that runs into such a drain is pure, we should like to drink of it. But water passing into such a drain, coming directly from the scrapings of a barnyard or a privy vault, can not be pure, and you can not make it so.

You may say that in cities wells may be objectionable, but in the country, Oh, no! The pure and happy country, with the pure air sweeping over the fields, joining in laughter with the rippling brook. That is all well enough, but the cesspool and privy vault, the stable-yard manure and kitchen offals are as real in the country as in the city, as you can find by examination.

The farmer has a fair heritage. The broad fields are his, not only to cultivate in the most approved style, and to feed and keep his flocks upon in comfort to them and profit to himself, but he has the chance often denied to dwellers in the cities, viz.: of living in healthy houses, and though poor, of at least having fresh, pure air and water; food he already has.

The farmers of Indiana need not be poor, if only they will pay attention to the rules of hygiene as they apply to both man and beast. They shall then be as princes, their homes better than palaces, their flocks and lands prolific and productive, and last, their children and their children's children develop into a hardy, enlightened and enduring race that conduct the affairs of home or State with energy, prudence and foresight.

Again, there is more than obtaining enough to support life—more than so many bushels of grain to the acre, or so many hundreds weight of beef or pork. All labor is no doubt toil, but toil has its ameliorations. Permit me to quote the following, in every word of which is truth. I regret I can not refer you to the author:

THE WAY TO LOOK AT IT.

"In all labor there is poetry, if we can but find it, containing its deepest meaning and its truest realities. One mechanic sees nothing beyond his tools and their daily use; another beholds the civilization or refinement which his work is daily spreading. One merchant measures his business only by the yearly account of profit and loss; another sees in it the extent of commerce, the employment given to labor, triumph of honest principle. One physician looks at his profession only as a ladder for his own advancement and popularity; another beholds suffering assuaged, diseases overcome, sanitary habits enforced, healthful living secured, happiness increased. One woman sees in her house only an area of hard work and physical discomfort; another sees exquisite pictures of possible happiness, honor, development and value, which may be cherished with it and may issue from it to bless society and strengthen the nation. It is only as these higher truths of labor become vividly pictured in the imagination that labor itself can rise to its true position. Its poetry is its best realty and ennobles all its prose of hard work or dry details."

Some, no doubt, will say, "We believe what you say, we admit your premises and your deductions, but how are such ends, so beneficial, to be brought about? Who will not only point the path but lead to the accomplishment of the desired object?

What is everybody's business is nobody's work.

There must be some organization to plan and execute while all assist. Indiana has to-day such organized bodies, viz: a State and Local Board of Health, whose duty it is to investigate as to what is needed to insure the health and comfort of the citizens of the State. And when such knowledge is attained by means of such investigations, it is their further duty to formulate the proper plans for the accomplishment of the end in view. But such organized bodies must receive the material and moral support of each citizen of the State, for without such support they will be of no practical value.

If the citizens of the State give their mutual and moral support to such organization, a wealth that to you now may appear as fabled will be realized, and not all the wealth resultant of agricultural, mechanical, or mercantile interest in the State shall equal that which flows in the wakes of sanitary reform.

THURSDAY—MORNING SESSION.

When Mr. S. R. Quick called the Institute to order this morning, there was a very fair attendance, considering the rain.

THE MUTUAL DEPENDENCE OF THE INDUSTRIES.

BY PROF. R. T. BROWN.

The industrial pursuits are naturally divided into industries of production, and industries pertaining to relations and circumstances. To the first chapter belong agriculture, mining and manufacturing. In the second, we have commerce, including transportation and exchange, literature, and the pursuits that are generally known as professions.

In order to a proper understanding of our subject we must premise that values are of two kinds, to-wit: intrinsic, or real values, and commercial, or exchangeable values. Intrinsic value is always the product of labor applied to something in such a manner as to increase the utility, or usefulness of that thing; and this increased value is technically called production, and hence the labor which imparts this increased value is properly named a productive industry. The thing on which we expend labor, and the tools and implements by which we apply it, is called capital, because it is supposed to stand at the head and be indispensable in all productive processes. Because money is now the representative of all values, we have diverted the term capital from its original meaning, so that in commercial language it means money. But it is a misnomer, whether it means money, or that which money can purchase; for the thing to which labor is applied is no more a necessity in the production of value than is the labor itself. Last September a man had an acre of ground worth $50 and a bushel of wheat worth $1.00. To this capital of $51 he applied $5 worth of labor, and next June that field, with what is on it, is worth $75. Now, the increase of $24 in value is not to be credited to the field and seed more than it is to the labor. Both were essential and each alike necessary. Indeed, every step in the process is dependent on the others. No amount of labor applied to the soil could have produced anything without the seed, nor could any labor on the seed have multiplied it without the soil—nor could the soil and seed have produced the increased value without the judiciously and intelligently applied labor.

If this dependency of labor on capital and capital on labor, and the production of value on both jointly is apparent in agriculture, it is more prominent in the mining and manufacturing forms of industry, for in some instances the earth yields her fruits spontaneously, demanding no other labor of man than that necessary to gather and prepare it for food or market. The marble in the quarry and the ore in the mine have no value till labor is applied to them, and the great forests are of no use no, not even for fuel, till they are the subjects of labor. But mining and manufacturing skill make the worthless forests and mines of priceless value by the application of labor, producers of the countless forms of utility and beauty which form the distinctive features of civilized life.

It is the common boast of agriculture that it feeds and clothes mankind, and so it does remotely—that is, by furnishing the raw material of food and clothing; but here the manufacturer puts in his claim. Fleeces of wool and bales of cotton can clothe nobody till they have passed the spindle, loom and sewing machine of the manufacturer; and the farmer's grain can not "give bread to the eater" till it has passed through the mill and the oven.

So the manufacturing industry steps between the farmer and the hungry and naked millions, and claims its indispensable position. But while agriculture and manufacturing each claim precedence, mining stands between both, and points the one to his plow-share, his cultivator, and his other nameless implements of metal; and to the other, he shows his steam engine, his tools, and the indispensableness of metal in the progress and success of all industries. These three productive industries form a tissue of mutual dependencies such that one can scarcely exist without the other, nor civilization without all. But when the co-operation of these begins to produce values, commerce, an industry of a different class, becomes a necessity in the progress towards civilization. The products of the soil, the mine and the factory, or work-shop, must be exchanged each for the other, and as these can not always be located in close proximity to each other, transportation becomes indispensable, and though the mutual change of place between the raw material from the farm and the finished product of the factory, has in no way changed the intrinsic value of either, yet each has acquired a commercial value, in addition, equal to the time, labor and risk incurred in transportation and exchange. This aggregate of the two values, constitutes the present value, but not always the new price.

This introduces us to a class of imaginary values which we shall qualify by the adjective *speculative*. It is that which is given in exchange for a commodity over and above the aggregate of the intrinsic and exchangable values. But this does not fall within the range of our present subject, for speculation, however rapidly it may accumulate values that others have created, it is in no sense a legitimate industry.

The creation of commercial value is an evil, as it adds nothing to the serviceableness of the commodity. A barrel of flour taken from Minneapolis to Liverpool will neither make more, nor better bread than it would where the wheat grew, but it has acquired a commercial value equal to the labor and risk of transportation and exchange; therefore commercial value, though an evil, is a necessary one in every organized society.

It is, however, the true policy of productive industries to reduce to its lowest terms the superadded commercial value.. The end may be reached by two routes: First by bringing the producer and consumer as near together as possible; or second, by increasing the facility and safety of transportation and the certainty of immediate exchange. All productive industry, to be profitable, must have a reliable market; or, in other words, production and consumption must correspond to and keep pace with each other. It is, therefore, the interest of each industry that every other one should prosper, that it may be able to give its products in exchange for those of its fellow-laborers.

The preponderance of the agricultural over the other forms of productive industry in this country, and its deficiency in Europe, is apparent in the large exportation of farm products within a few years past. While our farmers are rejoicing at the heavy balance of trade thus turned in our favor, yet it is in fact a misfortune that the fields of production are 4,000 miles away from the shops and factories of the consumers, inasmuch as it must create a heavy addendum of commercial value, which is generally divided between the producer and consumer. We are aware that some economists deny this, but as long as a bushel of wheat will sell for more money in Manchester or Liverpool than the farmer gets for it in Chicago, the common sense of the people will decide the question correctly. It is certainly the interest of each productive industry to encourage the location of such other business enterprises as will consume its products, and at the same time not compete with it in its own special line of production. While we admire the high appreciation of their own business, which farmers manifest in their anxiety that their children shall adopt the time-honored occupation of the plow, yet we must confess, it betrays a want of proper appreciation of the relations and dependencies of the industries on each other. Farming has now a preponderance in this country over other productive industries that is evidently to its disavantage. The manufacturer, a thousand miles away from our grain fields, eats our bread at an advance of twenty per cent. over the home price of the producer, who in turn wears the fabrics of foreign looms at a similar per cent. over cost; both of which charges might be saved by placing the two industries in near proximity to each other. The interest of every productive industry is to make the largest possible increase of intrinsic value, and to find the nearest and best possible market to consume its surplus products. The true economy is that a State should so balance its industries that each should consume the surplus products of the other with the least possible cost of transportation and exchange; but this is not always possible in our present state of knowledge, and, perhaps, it never will be in any advance that science may make. Agriculture must seek the proper soil and climate, and mining can be carried on only where minerals exist. We can not make wheat-fields in the Desert of Sahara, nor successfully raise maize in Siberia. But thanks to the steam engine, we can now build our factories wherever fuel and water can be obtained, and the advance in electric science is a prophecy that the waste power of Niagara may yet be distributed to a thousand factories and mills hundreds of miles away. This portable character of power, even as it is now developed in the steam engine, is proving a great distributor of industries and an important factor in equalizing values, for even when it has not been able to bring the producer near to the consumer it has done the next best thing possible—it has reduced the cost of transportation to its minimum; thus, to a great extent, relieving the productive industries of a heavy burden of commercial values. Indiana has an area of more than twenty-one millions of acres, and if we allow one-fourth for waste land we will have our sixteen millions of available agricultural land left. An area sufficient to produce food and clothing for at least ten millions of people; and with our improved implements and modes of cultivation, the work can be done by half of that population. We should then be able to furnish, for cash at home, the food and clothing for four millions of manufacturers and one million of miners, merchants, and professional men, at almost no expense for transportation or exchange. This is the possibility, but it is not the probability we will ever approximate it within a century, if ever.

While the agricultural industry has in Indiana a most favorable soil and climate, yet this State is scarcely less favored in its facilities for manufacturing. Our abundant and cheap fuel furnishes a power for manufacturing that even water can not rival. Our excellent building material, our temperate climate, our near proximity to the raw material to be manufactured, and our ability to feed the operatives from our own soil. are rare inducements to manufacturers. An important question of financial policy is presented to Indiana farmers, in the proposition to invest the surplus earnings of their farms in the stock of manufacturing establishments, rather than to put such funds into "more land," whether at home or in the far West. The first demand on the surplus means of a farmer is the improvement of his farm, but if these improvements are properly and permanently made, he reaches a point where a repair will demand but a small part of his income, then the question of the most profitable investment will arise, and it should be carefully considered. Is it the true policy that a man should raise all his children to be farmers, or should he aim to make merchants or manufacturers of a part?

But we have already intimated that there are legitimate industries that do not directly produce intrinsic values, and yet are almost indispensable in civilized society. Foremost in this rank stands the complex industry of commerce, consisting of transportation and exchange. Formerly these two functions were united in one individual, but modern economy has made a division of labor, and now, generally, one party transports and another sells. Productive industry is indispensably necessary to the existence of commerce, for if farming, mining and manufacturing produce no more than is consumed by the operatives in these branches, there would be nothing to transport nor exchange On the other hand, if the productive industries are not absolutely dependent on commerce, they are practically so; for the times when farmers from Central Indiana hauled their wheat to the Ohio river in two-horse wagons, by days' journeys of twenty miles—camping by the road side at night—frying their own bacon, making their coffee and eating stale bread that they had brought from home—these times can never return, however much we may complain of railroad monopolies and extortions. If producers and transporters really understood the mutual dependencies of each on the other, it would materially modify the antagonism which has been engendered by mistaken counsel between these kindred and dependent interests. The truth is, we can not now live without steam transportation, and steam transportation can not live without patronage

But further removed from the material—there is a class of purely intellectual industries to which we owe much of human happiness, and which, indeed, adds largely to the commercial value of property. This is known by the general, though rather unmeaning name of professional industry. The teacher is a necessity and good schools enhance the value of property.

The church and the school, each with its appropriate teacher, may be grouped together with authors, editors and other literary laborers, and regarded as important factors in the maintenance of an advanced civilization. The legal and medical professions will continue to be convenient, if not indispensable evils, so long as dishonesty and disease afflict mankind. In an emergency we are dependent on them for their knowledge and skill, as they are dependent on us for food and raiment. In short, whatever a man may do that adds to the common stock of human comfort is a legitimate industry and belongs to the great family of correlative industries. But there are occupations that involve great labor and care, both mental and physical, and yet confer no favors on society and add nothing to human happiness. The great brood of what is generally known as speculators, the professional gambler, and the liquor seller may be taken as samples of laborious but not legitimate industries. No one is dependent on them for any of the elements of human comfort. They are parasites on the body politic and draw a subsistence from others, while their labor adds no value to anything.

Ques. Didn't you forget that the liquor business enhances the prices of grain?

Ans. And yet it does not add one particle to human comfort. Our hominy mills, etc., would monopolize that. As to the revenue we get from it as a State, we get about three hundred thousand dollars into our school fund, and it costs us a little more than eleven million dollars to get it there.

Ques. What proportion is the agricultural to the whole population of the United States?

Ans. Between four-fifths and five-sixths.

Ques. If we could, would it be advisable to shut our doors against all foreign nations?

Ans. No, sir. The more you have, the more dependent you become. The more a Nation has, the more dependent it becomes. No one is independent but the savage who kills his animal, skins it for raiment, and cooks its flesh for his food, and dwells thus by himself.

Ques. *S. R. Quick:* Doctor, having heard how you frequently walk to Greenwood from Indianapolis, a great many of these farmers would like to know just how old you are.

Ans. Dr. Brown looks all around the audience, and finally says: I was looking to see if there were any good-looking women in the audience before I answered that question. I am in my seventy-fifth year.

FARM DRAINAGE.

BY J. J. W. BILLINGSLEY.

The history of farm drainage in this State dates back a period of forty years, beginning with the construction of wooden drains, which were intended to rid our fields of muddy sloughs, low boggy lands, and ponds that were in the way in the cultivation of our crops.

There are members here to-day familiar with the construction of such drains, which was, to dig the ditch of sufficient depth to have the drain below the reach of the plow. The timbers were usually broad rails split from solid oak, and placed edgewise on the side of the drain at the bottom of the ditch, and timbers split from blocks sawed the required length, to lay across the timbers in the drain; then cover the timbers with clay, sometimes a little straw first, and fill up afterward with clay and top soil.

These drains served a good purpose—farmers were delighted to grow sixty or eighty bushels of corn where only a slough or pond existed before, and the satisfaction of turning loose mellow soil, dryer than other portions of the field, where perhaps we had rolled up our pants (being barefooted) to follow the plow through the water, if we croosed it at all. Besides we could plow the field several days sooner in the season.

But these drains were shallow and short-lived, lasting ten, twelve or fifteen years at most. Such drains were a harbor for minks, muskrats, and other vermin. Muskrats would open up holes to the surface, and surface water in heavy rainfalls would soon open large and dangerous holes in the drain, into which teams were likely to step in the cultivation of the land.

About the year 1853 or 1854 a hand machine for manufacturing tile was introduced into this State, at Fort Wayne, through the encouragement of Hon. I. D. G. Nelson, and a factory built for the manufacture of tile, Mr. Nelson furnishing the money and agreeing to take his pay in tile. About the same year, or the year following, another similar factory was established in the county of Johnson. Following this, another was established in the county of Franklin, by Robert Thomas, an Englishman, who sent to England for the patterns to construct a wooden hand mill. Mr. Thomas' knowledge of the business, acquired in the "old country," has been very valuable to the tile interest in this State.

KINDS OF TILE.

The tile first manufactured by machines were of the horse-shoe pattern, without any bottom, the water flowing over the bottom of the drain, or over a plank which was sometimes used to set the tile on.

The next tile placed upon the market were bottomed, which were objectionable, because they left a wide space on the bottom, and did not confine the stream flowing through the tile to a narrow channel, giving a current sufficient to wash out the dirt or silt collecting in them when the water run low.

Then we had the sole tile, with round cavities, and with a flat bottom outside. Many of these are manufactured and used at this time, and, I might add, are preferred by many persons.

The latest pattern, and that most generally in use, is the round tile about one foot in length, which may be turned any side up so as to make the closest joint, and may be laid in collars, which are about three inches in length, covering the joints, the ends being inserted into them. Collars are seldom used, however.

The largest size of tile four or five years ago did not exceed six or seven inches; now there is a demand for ten and twelve inch, and in some localities even larger sizes.

TILE MACHINERY.

It may be said that the hand machine was soon superseded by horse-power machines, and within the past two or three years large numbers of these have been changed to steam power. Some factories make as many as three million tile annually. This industry has had a very rapid growth in the past ten years.

In 1870 there were probably as many as eighty factories in the State; in 1880, 486. The county of Grant alone boasts of having thirty-two factories. A few counties have no factories, or only one or two, where tile are greatly needed.

In the States of Indiana, Illinois, Michigan, Ohio and Iowa there are estimated to be in round numbers 1,300 factories in operation.

The increased interest in farm drainage is not, however, confined to the States named, but is as wide as our country. On the Pacific coast, factories are being erected, and some are already in operation. Inquiries as to the benefits of drainage are coming to us from many Southern States, including the Carolinas and Florida, and along the Atlantic seaboard. The fast-growing West quickly caught up the advantages to be gained from farm drainage from the reports of John Johnson's experience at Geneva, New York, and our own Hoosier State soon outstripped the solid old Empire State, which has at this time only a score or more of factories, notwithstanding the fact that a few years ago a committee of very intelligent gentlemen—practical agriculturalists—reported to the State Agricultural Society of that State, that there were few farms in the State but what would be benefited by more or less underdrainage. But there are signs now in that State of a fresh awakening to the importance of this agricultural improvement.

I have briefly sketched the history of this interest that you may have an idea of its growing importance in all the States and Territories. Tile drainage is no new thing under the sun, for we have a record of it far back in Roman history; but in this "New World" it dates back only a few years.

WHAT SOILS NEED DRAINING?

I might answer this question by saying, that *all* soils that are not readily freed from excessive moisture, where the spaces between the particles of soil are full of water for any considerable length of time after a rain-fall, or full from spring-water, need drainage.

All clay soils, with no underlying strata of sand or gravel near enough to the surface to receive the surplus water, need drainage; and all rolling lands with retentive clay subsoils need it.

As to the drainage of swamp lands, we are all agreed that these should be drained to free the country of the malarious troubles arising from them. and to bring them into cultivation. Such lands are usually very productive, being rich with decayed vegetable matter, and only need to be freed from the surplus water and come in contact with the air, light and heat to supply all the conditions of a luxuriant vegetable growth.

But when I speak of draining gently undulating lands, which have a retentive clay subsoil, some will be ready to say the cost will overbalance the profit; and then if I should take another step in advance, by advocating the drainage of rolling lands, I would likely see an incredulous smile on the faces of many. One and another will be ready to say: "There's theory for you—more book farming."

But before we proceed further in this line of investigation we will turn our attention to the effect of drainage upon the soil. The age in which we are living asks not only for facts, but for the causes. A truthful statement of facts is not enough for the inquiring mind. It asks for the cause producing the effect. Drainage removes the surplus water, or water of saturation, which fills the spaces between the particles of soil, allowing it to pass off through the drain—leaving only the water of moisture necessary to plant growth. If the water is not removed in this way, then it must be removed by evaporation and slow percolation.

Farmers know their fields as they know their stock, and speak of them as "warm soils," "cold soils," and "sour or sodden fields." But what makes the difference in their characters? The "warm soil" may be a gravelly or sandy loam, with underlying stratas of sand and gravel (like much of the soil around this city,) allowing the surplus water of heavy rainfalls to pass away readily beyond the probability of harming the roots of the growing crop—the soil readily absorbing the heat of the sun, which is so necessary to plant growth. The "cold soil" has a retentive clay sub-soil through which the water percolates slowly, if it has an outlet below at all; otherwise when the spaces in the soil are filled with water, if they are not drawn off below, it must be removed by evaporation at the surface, which is a cooling process.

THE EFFECT OF EVAPORATION

is illustrated in the wrapping of a water jug in hot weather with a wet cloth to keep the water cool. The air coming in contact with the water in the cloth vaporizes it, taking up the heat surrounding the cloth, passing it away on the wings of the wind, leaving the water cool. This process continues until the cloth becomes dry, or nearly so, before the temperature of the water in the jug begins to rise. So it is with the soil. It must remain cold as long as there is any considerable quantity of water remaining to be removed by evaporation.

By underdraining we remove the surplus water, enabling the soil to store the heat of the sun. Then we have as one of the effects of drainage an increased temperature of the soil, or a "warm soil," one of the conditions so necessary to the germination of the seed and subsequent plant growth.

DRAINAGE INCREASES THE POROSITY OF THE SOIL.

The water descending to the drain below, passes through the spaces of the soil and sub-soil, finding its outlet through the drain, opening many thousand little channels, leaving the soil porous. When the water of saturation is removed, these spaces are filled with air, which acts upon the soil and sub-soil, and tends to change its character, adding to the subdivisions of it.

Again, the action of the frost upon our soils pulverizes them. We say after a long, cold winter, that "the soil will turn up mellow and be easily tilled," because of the frost. Well, it is a notable fact that drained soils freeze much deeper than undrained soils.

A soil saturated with water will freeze but little deeper than ice will form on the water surface of our ponds; but allow the water of saturation to be removed nearly as rapidly as it falls, leaving the spaces filled with air, and the freeze will penetrate two or three times the depth it would otherwise. So true is this, and so well known from observation, that I need only say that drainage admits of an increased action of frost upon the soil, further increasing its porosity. Another important condition necessary to the growth of our crops is the

AERATION

of the soil, which is promoted by drainage. As before stated, the spaces that fill with water when the soil is saturated are filled with air when the water of saturation is removed. The air coming in contact with the mineral elements of the soil produces chemical changes, and these changes result in the formation of other combinations which promote plant growth.

A permeable soil is the theatre of chemical changes of the utmost importance in the perfection of plant food. In addition there are

ELEMENTS OF FERTILITY

in the air which are absorbed by the soil. The rainfall, in its descent through the air, has obtained carbonic acid, ammonia and nitric acid, extracted or washed out of the air. The water in its passage down through the soil gives up these fertilizing elements to the soil, which are held by it for the use of the growing plants. Drainage also promotes the availability of manures and fertilizers applied to the soil.

As we pass along upon our railways we see here and there manure scattered or piled up in the fields. Rains wash the manure; if the soil is open, it will receive the liquid manure, and hold its elements of fertility. Then we get the benefits in the future crops. Otherwise, if the soil be full of water and the liquid manure flows off into the streams, it occasions a great loss. We say, then, drainages makes our manures and fertilizers go further, i. e., further down into the soil—not further down the stream.

Let us bear in mind that drainage promotes the porosity of the soil; that the soil, in a limited sense, is like a sponge, to gather up the rainfalls. True, when we have a very heavy rainfall, a portion may pass off over the surface of rolling lands which are drained, but as a rule the water of ordinary rainfalls will be taken up.

Now, for the reasons why rolling lands should be drained, where they have a stiff, cold, retentive clay subsoil—which are, to prevent the surface wash, which carries away the best of the soil into the rivulets and streams; to make it porous, and increasing the depth of the soil. Such soils, without drainage, become wet, and are sometimes sodden. The underdrainage of hill lands has been well tried in Europe, and even the deep drainage of them is practiced and highly recommended as a means of increasing their fertility—the manures and fertilizers being readily absorbed and held, which otherwise would be washed away. In Scotland, where Burns sang of his "Highland Mary"—hilly Scotland—the drainage of their hill lands, to preserve their fertility, is receiving not only the careful attention of progressive farmers, but is recognized as being a question of great import in sustaining its population and increasing its wealth. Just think of it! They advocate deep drainage of hillsides—four feet or more. I received only the other day large daily paper from Edinburgh, Scotland, dated January 15, 1882, in which I found the leading article devoted to this subject.

There are other benefits resulting from drainage, that we have not the time now to speak of, but to which we will briefly refer, as we proceed to consider

PRACTICAL WORK IN DRAINAGE.

In the construction of drains, the first point of importance is the outlet, which should be located so as to provide for a free flow of the water away from it. It should be so located as to give necessary depth to the drain. It may be located at a point where the surface drainage of the land enters into a stream, but it will usually be found best to locate the outlet either above or below the natural outlet, for the reason that it will be less liable to damage from floods of water that may rush over the surface from heavy rainfalls, depositing debris and soil at the mouth of the drain.

The location of an outlet as indicated, may necessitate deeper digging and a little more labor at the time, but it will more surely protect against damage. The outlet should be protected by rip-rapping the bank, or other protection, to prevent the tramping of stock. In thorough work, the location of the outlet and all the main drains and laterals, should be done with a level. I do not mean that you should necessarily employ a civil engineer, which it might be well to do, if one can be had conveniently, at a reasonable compensation; but you can mount a common spirit or carpenter's level on a staff, and adjust sights to it, and with it determine pretty accurately the amount of fall to be had in different directions. A very convenient instrument for this purpose—easily adjusted and one that can be used by any man of ordinary practical skill—is the Sibley level, costing only $10 and express charges, manufactured in New York. The use of such instruments in the hands of a practical man, will enable him to plan a system that will prove efficient and economical, saving many dollars in the cost of the work when completed.

The plan of draining a particular field (if it embraces only a field) or larger area of land, should be plotted on paper, noting the fall and depth of drains at different points and size of tile used, for future reference.

The plan adopted should contemplate the thorough drainage of the entire plot of ground—not at once, unless your means at hand justify it, but by thorough work, if it requires years prospectively to complete it.

SIZES OF TILE.

The tile in the main drain should be of sufficient size to receive and pass away in twenty-four hours, at least half of a heavy rain fall.

As to the proper sizes to be used for a given number of acres, depends so much upon the fall, the depth, and the laying of the tile, that I hardly care to venture upon it

I do believe, however, that the following sizes for the number of acres named will approximate it, where they have only to carry the water that falls upon the area to be drained: Three-inch will carry the water off of five acres; four-inch, ten acres; five-inch, fifteen acres; six-inch, twenty-five acres; seven-inch, thirty acres, and eight-inch, forty acres.

Sizes of tile should be selected, however, taking into consideration not only the area to be drained, but also the fall to be had. The descent determines the velocity, other conditions being equal.

The benefits derived in laying a single line of tile, has proved in many instances an inducement to further extend the work, when it is found that the first tile laid is not of sufficient size to convey the water, and must be taken up and replaced with a larger tile, with many regrets, etc. Hence the necessity of a well-matured plan of the intended work.

DISTANCE BETWEEN DRAINS.

In ordinarily porous soil, it is generally conceded that sixty feet apart is sufficiently near; in more retentive clays, they need to be nearer together in thorough work. In fact, the distance apart depends very much upon the depth. There are soils—the lighter loams—however, upon which the drains may be a much greater distance apart, depending upon the

DEPTH OF DRAINS.

Upon the question of depth there is a difference of opinion. The average depth of the work already done will not, I think, exceed thirty inches, and much of this work lies in the way of future progress in this important improvement.

In the discussion of this branch of our subject, I might ask:

Is a deep soil better than a shallow one?

Is it better to have the roots of our crop near the surface crossing and recrossing each other in search of plant food, or have them go down deep into the earth where there is an abundant supply?

In considering this subject of depth please bear this fact in mind, that the roots of our growing crop will not descend below the top line of saturation, they avoid going into the water. If heavy rainfalls come, filling the under soil with water into which the roots have already descended, and remains around the roots, they soon begin to decay, and the plant yellows and is soon damaged if not destroyed, and every plant affected will show the hailing sign of distress.

Suppose we fix the minimum depth of a drain at three feet and the average depth at four feet.

First. Because at four feet the line of saturation, or water table, will be so far down as not to affect the surface by the chilling effects of evaporation.

Second. Because it will give to the roots an extended pasturage. But some party will say that the roots will not go down so deep. But we have abundant proof to the contrary. Mr. S. J. Woolley, of Hilliards, Ohio, had occasion last year to take up a line of tile laid at the depth of four feet and replace them with a larger size. The work was commenced soon after the wheat on the field had been harvested. He found that the roots of the wheat had descended not only as deep as the drain, in large quantities, but were found matted about the tile. Besides I could, if time would permit, give you the statements of many others to the same effect. Corn roots have frequently been traced to the depth of eight feet, and even deeper. Roots of our tame grasses go down to a depth of three feet or more, if the water table will admit of it.

Third. A drain at the depth of four feet will drain a much greater width of land, and withal, it is economy to drain deep in thorough work. Mr. Armstrong, of Rossville, Illinois, has laid within the past three years seventy miles of tile, maintaining an average depth of 4½ feet, and, in order to get his water out by the nearest route, does not hesitate to lay his drains as deep as nine feet at some points. Mr. W. W. Lowe, formerly of Shelbyville, now of our city, cut a drain through a ridge in a poor clayey field that was reckoned to be hardly worth cultivating. The tile at the deepest place were laid a depth of seven feet in order to drain a pond of four acres, lying beyond the ridge In a period of two or three years he found that the soil at the point where the drain was the deepest, was as productive as any on the farm. This fact led him to thoroughly drain his entire farm.

Four feet then seems to be the standard depth; it can not be always had, but better to go deeper than not so deep when possible. Depth and distance between drains should bear a relation to each other. The character of the soil and sub-soil is an important factor in the question.

I know there is a feeling that two feet or thirty inches is deep enough, and I know that such drains will do good service, and that it is better to drain at that depth than not to drain at all, but I believe that drains at four feet will do better. Theory indicates it, and practice confirms it.

THE LAYING OF TILE

is thought to be a very simple business. Something that almost any one can do to perfection, but it is not the case.

Tile should be laid firmly in regular line of descent, if one tile is down and another up, or if there be depressions where the water has no current or must rise in the tile in order to flow over a rise in the drain beyond, then silt will likely gather at such points. The joints should be close and even—if tile are shouldered at the joints, the water in its flow will strike across and retard the flow. If any one is not certain of this, let him go and watch a little stream and note the direction the water takes when it strikes against the bank, and apply the same principle to water flowing in a tile drain.

LATERAL OR SIDE DRAINS

should enter the main drain at a sharp angle, so as to unite the two streams with the water flowing in the same direction, as near as possible, otherwise if the water enters at a right angle it will cut across the pipe retarding the flow in the main drain, lessening its capacity.

SELECTING TILE.

In the selection of tile be careful to get the best. A tile should have a clear, metallic ring and perfect in shape. If it is crooked or flattened, the capacity and efficiency of the drain will be impaired to a corresponding extent.

For my own use I prefer round tile for the reason that I can turn them any side up, so as to make the closest joint, but bottomed tile with round cavities are good enough.

DURABILITY OF TILE.

How long will a tile last? My answer is, if the tile be laid below the action of frost, are well burned, they will last, well, one thousand years, so far as I can see. The Hon. Mr. Richmond, of Ohio, while on a tour to the Eastern Continent, visited the famous ruins of Ephesus, and in his explorations dug up and brought home a tile that shows no signs of decay, and we know that it has been in the ground at least 1,700 years, which indicates, I think, sufficient durability. Yes, gentlemen, the corroding hand of time will soon destroy the houses we live in, will level the stones that mark our last resting place, and the footprints of our industry will soon be effaced, but the tile we lay deep and well will last on down to the latest generations. Money invested in drainage will not only return us annually a handsome per cent. as long as we live, but also our children's children a profit.

BUT WILL IT PAY

to thoroughly drain our clay soils? We know it will pay to drain our wet lands, swamps, quags, sloughs and muddy little drains in our fields, but will it pay to drain our clay soils that have a fair surface drainage, at a cost of $12, 15 or $20 per acre? That *is* the question!

Suppose we take ten acres of average clay soil, and it is a fair estimate I think to estimate an average yield of fifteen bushels per acre for five years, then expend $20 per acre in draining it, and a fair estimate with like culture as before, will be twenty-five bushels average annual yield per acre in a period of five years, the difference is ten bushels, which we will say is worth $1 per bushel, or a gain of $10; or, to be sure that we are safe we will estimate it eight bushels or $8, which is certainly a very paying per cent. on the investment. But you may ask, will it do it? It is my experience that it will; but I will give the statement of one high as an authority, Mr. W. I. Chamberlain, the Secretary of the Ohio State Board of Agriculture, in a public address delivered at Columbus, Ohio, a few days ago, in my hearing, made the statement - that his farm in the Western Reserve of that State, having a close, retentive clay soil before drainage, with good tillage and manures, made in a run of five years, an annual average of thirteen bushels of wheat per acre, and (Mr. Chamberlain is one of our best practical farmers,) after thorough drainage he said, I have made an average in the past five years of forty-two bushels per acre. John Johnson, of Geneva, New York, had an average yield of eleven bushels before drainage, and forty bushels per acre after drainage, for many years. But, gentlemen, it must be admitted that these men have brains as well as soil.

I could name other instances of like success, but you will remember that in my estimate I put the average at twenty-five bushels, and I believe it will be realized by the average farmer, and more than realized by the progressive one. About the same difference will be realized in the increased production of corn and other cereals, and even grasses.

IMPROVES THE QUALITY.

We have the additional advantage arising from drainage in the improvement of the quality as well as an increase in quantity. Both grain and grass are of a better quality, commanding a higher price, or is more profitable to feed. Yes, gentlemen, the investment of money in the thorough drainage of soils that need it will pay a big per cent. for all the years to come, and the bank will never break.

There are other benefits from thorough work that I will only hint at. It protects against damage from

DROUTH.

During the past dry season you have observed that your best corn was over or near your drain, and many of those drains I have no doubt were shallow, but the benefits would have been much greater if the roots had gone down into the soil four feet deep to draw on the moisture and fertility of the great storehouse of nature.

In sections of country where deep thorough, drainage is the practice the benefits are much greater, but drainage also lengthens the seasons. The soil can be plowed many days sooner and the warmth of drained soils hastens germination and growth, which gives time for early and full maturity. Let me in conclusion briefly epitomize a part of the benefits resulting from

DRAINAGE.

Prevents damage from wet weather.

Protects against damage in dry weather.

It deepens the soil.

It prevents the washing of the soil.

It promotes the distribution of fertilizing matters through the soil.

It increases the temperature of the soil.

It lengthens the season for labor and maturity of crops.

It aids in the germination of the seed, insuring a good stand with careful seeding.

It prevents the packing of the soil.

The soil is more easily cultivated.

It supplies only the necessary moisture.

It admits the necessary air to the roots.

Prevents the freezing out of crops in winter.

Insures largely the uniformity of crops.

Increases the yield of crops fully 33 per cent.

It greatly improves the quality of the products.

It improves the health of man and beast, and is the best investment of money and labor that can be made.

Emerson says: "There are farms underneath our farms we know not of until we thoroughly drain."

Ques. Is there any danger of draining too much?

Ans. I hardly think so.

Ques. How long before the drain is properly put in, in stiff clay soil, before we fully realize the benefits of it?

Ans. I think probably five years.

Dr. Brown thought that twenty years would be more correct.

In answer to a question, Mr. Billingsley observed that he would not put tile in less than eighteen inches under any circumstances.

Then quite a spirited discussion arose as to whether drains should be put in parallel with a hillside, or straight down the slope. On this point the Institute seemed pretty evenly divided. Profs. Ingersoll and Brown took the latter ground. Prof. Ingersoll thought that if the drain should go straight down the slope the tile would attract the water from both sides, which would not be the case if parallel with the slope, and adduced the best experiments that have been made in this country and European countries in support of his position.

Ques. What is the least possible fall that should be tiled on?

Ans. *Billingsley*—Some tile have been laid on an almost level surface.

Adjourned till 1:30 P. M.

AFTERNOON SESSION.

By the time for reassembling in the afternoon the attendance was fully up to that of Wednesday, the large north court room being comfortably filled the entire afternoon. The speaking was fully up to the standard of Wednesday in an intellectual point of view, besides being more humorous, the audience being kept in an almost continuous uproar, either by the splendid hits made by the speakers themselves or by others who exerted themselves to make the closing session the best of all.

The house being called to order, the choir, with organ accompaniment, gave a beautiful song, commencing with—

Over and over again.
No matter which way I may turn.
I always find in the Book of Life
Some lesson I have to learn.

FEEDING AND BREEDING.

BY PROF. C. L. INGERSOLL, OF PURDUE UNIVERSITY.

Mr. President, Ladies and Gentlemen:

I need scarcely take time to call your attention to the fact that this is a progressive age; that the problems of the day are rapidly solved, and the principles obtained in the work and the discipline and force expended, are but so much capital laid up—so much reserved power stowed away to be used on a future day. Each succeeding year brings with it graver questions to be settled by the combined forces of knowledge, or science and experience, and to-day witnesses, more than ever before, these wedded workers in enthusiastic union traveling along our pathway and giving valuable lessons. Time was, when there was conflict between these two gallant workers; and each had its galaxy of adherents; each its earnest advocates to claim all excellence, all virtues for its own, and all faults for the other.

This day is happily well over; and when we have seen such a society as the Royal Agricultural Society of England adopting as its motto this noble sentence, "Practice with Science," we might feel that the battle was waning. When we see such men as Humphrey Davey, and Liebig, in Europe, and later such men as Prof. Samuel Johnson, of Yale College, and Prof. Stover, of Harvard, with a host of younger, but no less enthusiastic workers; I say when we see such men coming out of their laboratories and clasping hands with the farmers of this country, trying to help them and to solve some of the perplexing problems, it seems to me that we should all rejoice, and, advancing, meet them at least half way, and joining our mite of experience to the general fund, assist in the great advance all along the line. To-day we have met to do the work—to take up some of these questions, and by discussion to throw all possible light upon them. Many of these questions are those that have engaged the attention of farmers for many a decade. The one which I propose to dwell upon is one that has had much written upon it during the last seventy-five years. In fact, it has been a prominent question at times, when the question of profit to the farmer has been considered. Many persons fall into the error of supposing that these questions, when once discussed and settled, are disposed of forever. How great the mistake! Fifty years ago the stage coach and the canal packet were the convenient modes of travel; twenty-five years later, the owner of stock in these lines would prefer to dispose of it, and invest in other directions. Why? The transportation question has undergone a wonderful change, and even now it is not in a settled state.

In 1855, the tallow-dip and the lard or whale-oil lamp, gave out their pale and sickly glimmer. The geologist began looking around and soon found "more light" in the form of immense underground reservoirs, and the world reveled in the new-found luxury. Some savant shook his head ominously and said—"This may soon give out." "Some wells have already failed." Edison and others step to the front with a—"Let us utilize the electric fluid which is all about us and can be so easily obtained."

You all know its success to-day and the probable brighter future. Was the problem of furnishing the world with light solved when "tallow-dips" were in the ascendency and the neighbors went long distances to borrow fire if perchance their own went out?

Was it solved when the great reservoirs of coal oil were discovered? Huge cisterns formed by nature in ages agone for the benefit of this enlightened age? Is it solved with the advent of electric light? Who shall tell!

The problem of meat production is one of those great questions which have from time to time engaged the attention of agriculturists. This has been agitated, discussed and considered settled for different States and localities, several times in the last century. A question might be considered settled if the conditions of the problem were not changed, but as I said at the outset, "this is an age of progress." Progress implies change, and as we can not always force these changes, it behooves farmers, as well as men in trade, to keep their eyes wide open and to work understandingly. So surely as water finds its level and seeks an outlet at the lowest point, if there be an opening; just so sure do the commodities of production by the greatly increased and cheapened facilities of transportation, seek the highest market, and tend to lower the prices in these markets, while by the shipments the home markets are raised in price.

Ten years ago the English and Scottish farmers rested securely on the results of meat production as determined by the then existing conditions. Science joins hands with the farmer, and refrigerating compartments are fitted up which carry meat to Liverpool in a fresh condition and without taint. Only five years had passed and the whole English public were torn up over the project of having unlimited quantities of fresh meat and beeves, alive, thrust upon their market by their American cousins.

The press of the country was awakened. Commissioners were sent over to spy out the land and to see if the wild stories which had been wafted across the Atlantic, of immense areas where cheap meat could be produced, were true; and whether there was really as much danger as was anticipated. The English farmers knew full well what was the key-stone to their whole system of successful agriculture. It was "breeding and feeding;" and when the cheap meat from the Western Continent was introduced and this factor in their work was likely to be seriously disabled, they were astonished and almost panic stricken over the aspect of a question they had long ago considered settled.

The Agricultural Gazette, edited by the ablest men, said January 29, 1877: "A panic has almost been caused by the sale of this beef, which is pronounced better than home produce." The London Live Stock Journal, of about the same date, said: "The importation of meat from America is the chief topic of conversation at the farmstead, at the markets ordinary, and in all places where agriculturists do congregate, and is the new element introduced into stock breeders' calculations; the new year opens with an appreciable disturbance of the meat market, and already the gloomy prophets of evil are predicting a time of increased distress when the English farmers' last resource shall be taken from him."

This phase of the question has become somewhat modified. England and the Canadas have passed stringent laws in regard to the introduction of cattle, for protection from cattle disease known to exist on our shores. This is legitimate, but answers the purpose equally as well, to shut out the importation of most of the American beeves which would be shipped alive. Thus Americans are restricted to the trade in dressed meats almost exclusively. Competition has arisen, or is likely to arise, from other quarters. Buenos Ayres, S. A., and Australia each have an eye on good markets, and their farmers, too, are seeking for opportunites to make money; so, from these distant countries, have cargoes of dressed meats been sent to English consumers. The Danish provinces have caught the spirit of progress and send many of their cattle to these marts of trade, and we are told that they are doing better in the quality of stock presented to the buyer each year. Americans can rest on the honor of being first in this trade, but can not control it. We must compete with other producers.

These questions of consumption and transportation, of export and import, are grave ones, and the fluctuations constantly going on; and the demands of one class for protection by tariff, and of other classes for the removal, together with the constant tinkering of the laws relating to export and import, only prove to us more conclusively how far from being settled are these great questions, which touch with vital importance our producing classes.

[Speaking of the opening of the Mississippi to grain export, and effect of cheapening transportation of 12 cents from St. Louis to Liverpool.]

I think you will thus see that a large amount of good common sense must be used by the agriculturist—much more than would at first glance appear to be necessary. When we take up this matter of breeding in the abstract, we find that for a man to succeed he must have special qualifications, and,

First. He must be a man with a critical eye; one who is quick to perceive slight differences in form and general make-up. He must not be of that class of persons who always have the best horse, the best cow, pig, or sheep. On the contrary, he must be one who can see a defect in his own animals as well as in his neighbors', else how can he correct present defects in the future.

Second. He must be a man capable of having and holding to an ideal. But what is an ideal? says one. It is to have in your "mind's eye" a pattern which you wish to duplicate by your work, and such an ideal will always be the best animal you have ever seen, or a combination produced from parts of several. I have said he should be a man who can not only have, but hold to an ideal, i. e., he must not be constantly changing his mind. The good calf of this year must be the good calf of next year. The defect of to-day must be the defect for all time, if one would succeed. Our motto should be, "Fix a standard; place it high; maintain it."

Third. He must be a man of excellent judgment, and this must be shown in his first and subsequent selections of stock to breed from. Again, he must have keenness of perception and decision in regard to the coupling of animals to reach the best results. But we are met at the outset by this objection, that all men are not well qualified for this especial work. All men could not, if they would, breed pure bred stock. We grant all this and say that there is no necessity for all to attempt breeding pure bred stock.

Our breeders should be divided into two classes:

First. Those who have the ability and can succeed in pure stock; and,

Second. Those who are not so well calculated for that work, but can, when supplied at reasonable prices, with good, pure bred males, improve their herds in quality in a few years from 100 to 200 per cent. They may never attain to the highest type of animal, but can improve the milk production, or the size of the animal, its early maturity, etc., as a male of one kind or another is purchased, so that the real money value of the herd can be increased, and the profits, too

It costs very little more to keep a cow that will produce 400 pounds of butter a year than it does to keep one that produces but 200 and is dry four months in the year. It costs but little more to keep a breed of hogs that will make ten pounds of pork from a bushel of good corn than it does to have razor backs that do not produce five pounds from the same feed and are never fat until two years old. It costs but little more to keep a well-bred one-half or seven-eighths short horn or Hereford steer than it does a miserable scrub, and the former at two years old is ready for market, with more pounds of merchantable beef than can be put on the latter at four years old. This work every farmer can do—yes, should do. It is his duty to himself, his locality and the State. On the other hand we have those, a gallant few, who have taken hold of the production of the higher types, and our eyes are feasted each successive year by the exhibitions they make at our State and local fairs. Theirs is a noble work. It is no easy task they have undertaken, as the higher the type of animals in their herds the more careful must be their work and the more slow their progress. A single mistake in judgment in regard to the breeding of the herd may be a serious loss, not only in deteriorating offspring and consequent money value, but in his reputation as a breeder. These high types have been attained by the most careful work—in many instances by close or in-breeding to fix and make strong certain points which the owner wished to bring out prominent. After this they have followed breeding from animals that have had somewhat close affinities, sometimes called line breeding. In this some persons have supposed that they must succeed if at all. One must remember that undesirable characters and diseases are transmitted just as surely as the desirable ones, and may only be lying dormant in the system, waiting for a proper opportunity of development.

They must also remember that whatever intensifies an element of beauty in the form, or of quality in the animal in some other direction—as milk production in the cow, speed or strength in the horse, or character of fleece in the sheep—will just as surely intensify and strengthen any weakness or tendency to disease. On this point permit me to quote Prof. Sturtevant, late of Massachusetts, but now at the head of the New York Ex. Station. He says:

"So far as we have the facts in regard to breeding, it is found that crossing produces variation, and that by taking this variation, by selecting, we can produce particular results. Crossing also produces strength. In-breeding is productive of weakness. I have practiced it closely on my farm, with common fowl and with Ayrshire cattle. With the common fowl I reached perfection of color, form, plumage and size; but the result was in-fecundity, and we were obliged to give up the practice. My in-breeding of Ayrshires began in 1870. There has been an improvement every year, but in late years it has been very difficult to maintain the color, the tendency being strongly toward a light color or fading out. The calves show more and more weakness.

"You will thus see that improvement is variation more or less gradual, and is largely under the control of man within certain limits. The elements which are brought to bear in this work are climate, food and habit, as determined by the laws of heredity. You are all conversant with the differences between the cost of keeping animals in a sheltered pen or place, or in having them exposed to storms of wind and rain. There have been very few exact experiments on this point. Prof. E. M. Shelton, of the Kansas Agricultural College, experimented with pigs, and with the following result:

FIVE PIGS IN-DOORS.

Numbers.	1	2	3	4	5
Beginning weight	272	240	258	275	226
Ending weight	435	404	424	439	382
	163	164	166	164	156

Average gain, 162.6 pound for each.

FIVE PIGS OUT OF DOORS.

Numbers.	1	2	3	4	5
Beginning weight	244	229	249	252	285
Ending weight	401	366	372	369	409
	157	137	123	117	124

Average gain, 131.6 pounds for each.

"Difference in the favor of shelter thirty-one pounds weight of pork for each animal. To quote the results of weighed feed consumed we have: The average amount of food consumed for a pound increase, when no bran was given, was, in-doors, 5.19 pounds corn; out doors, 5.50 pounds. When fed with bran, in-doors, corn 4.56, bran 70; out doors, corn 5.78 pounds, bran 83; or those in-doors made 10.87 pounds of pork from one bushel of corn (56 pounds shelled), and those out doors made 10.21 pounds.

"This is but one instance where the effect of climate is practically shown in dollars and cents. If a man is feeding 1,000 bushels of corn, the shelter will make a difference of 660 pounds of pork when he goes to market, and this, at five cents per pound, equals $33 to place on the credit side of a bank account. Really in this experiment the climate and food are somewhat inseperable, as the animals in each instance were fed all the food that they could digest and assimilate. Then this variation, if begun and retrograde for a series of years, by the laws of inheritance will become so fixed that a whole breed may become dwarfed or affected by it. Plenty of good food, warm shelter and good care will make each succeeding calf or lamb better than its dam, unless by some mistake in judgment in regard to the breeding the offspring resemble some remote ancestor of inferior quality. This in turn ought to produce an animal as good as itself or better, and then the application of food and care will improve this and go on for each succeeding generation until the highest limit known is reached. Many farmers expect the name of the breed to do the improving, and heap imprecations on the head of the breeder because an animal in their hands has not done well, and because their calves and lambs are not fine as those of other men. They have yet to learn that half "the breed lies in the mouth," and that there is no true excellence without care and labor. Others again are looking for some great spasmodic variation which may be seized upon and will bring them wealth and renown. Such men very rarely succeed. They are waiting for the grand prize in a lottery, which they will never realize. Better plod along and climb upward a step at a time, putting each foot in turn upon every round of the ladder of experience. Prof. Wiles, in his admirable book on stock-breeding, very neatly sums up this whole matter when he says: 'Aside from the agencies that are made use of in improving the qualities of animals, (referring to food and care,) which have been pointed out in the chapter on variation, the art of breeding may be epitomized in the one word, 'selection,' which involves the application of every established principle of practice, and a consideration of the influence of every peculiarity of form.'"

This matter of selection does not apply solely to the herd, but takes a broader range—the selection of a breed for a specific locality and purpose. Many fail to see the proper connection between these two, and select the breed adapted for their particular purpose, but find too late that they are very poorly adapted to the circumstances and surroundings in which they are placed. On the other hand an occasional man errs in the opposite direction and gets the breed adapted to the circumstances and place, but not the one that is best for his purpose.

There is much more that might be said in regard to this subject of intelligent breeding. There are many questions that come into practice, and which could not possibly be discussed within the limits of any reasonable time. Of such a character are the questions relating to pedigrees and ancestry, line breeding as a consequent to improvement—stairsen or breeding back as a trouble in cross-breeding, or in uniting families not related. The influence of previous birth upon subsequent ones as giving more or less resemblance of later offspring to former ones. The influence of surroundings before the birth of an animal, during the formation period, including the effects of nutrition and in-nutrition, etc., etc.

Time would not allow of taking up these and other equally important questions in detail. Suffice it to say that the greatest of care should be exercised during the whole time you have this important work in hand.

Remove all untoward influences, not because they as a rule affect your animals, but because you ought to remove all exceptions from the lists in your work. In this, remember that success is attained at the cost of unceasing vigilance. A few words in regard to feeding and I am done. Indeed I have scarcely more than time to outline what I would like to say on the subject. The subject of Animal Physiology has been studied of late with reference to the action of the digestive system under certain foods, and to see how the processes of assimilation and excretion were carried on. Cattle foods have been analyzed to see what substances were contained therein and then these questions were asked: What per cent. of this element or of that is assimilated? makes beef or mutton, milk or water? What per cent. is indigestible and is thrown off by the system? What elements besides these indigestible substances are thrown off or excreted by the system by the kidneys or otherwise? To answer these and other questions required several series of experiments of the most close and searching character. The chemists weighed and anylized the excretion from the body and stood ready to tell about the waste and the quality of food consumed. The other persons attended to the weighing of all food, litter, and the animals. The results of these experiments are embodied in a series of tables. From what I have just said you will readily perceive that any intelligent and rational system would consist in giving to each animal a single article of food, or a ration containing a combination of elements, which would produce the best results, and that these results for profit depend on: 1st, the character of the food; 2d, its digestibility, and 3d, the value of the manure. Although the chemist will name over to you a large list of substances found in foods, yet these are reducible to three groups, known respectively as:

1st. Albuminoids or Proteids, containing it in some form, N. C. H. and O.
2d. Non-Albuminoids or Carbo-hydrates, containing C. H and O.
3d. Fats, another form of combination C. H. and O.

The first class of elements is largely used to build up the muscles—the flesh. The last two groups are largely the elements that go to keep up the animal heat and produce the fat. Food then, in order to produce the best feeding results, should contain these groups of substances in fair and proper proportions.

For an example, good timothy hay may be taken. This shows that in every 100 pounds we have 86.5 pounds of dry matter; that this contains:

Protein or albuminoids	6.2 lbs.
Fat	1.7 lbs.
Carbo-hydrates	45.8 lbs.
Crude fiber	28.9 lbs.
Ash	3.9 lbs.
	86.5 lbs.

A fair feeding of this will keep an animal from failing in flesh, and is thus a nearly perfect food, provided no extra demand is made on the system in any way. If this is the case, then more albumen is demanded, and something containing this, as some ration of grain is added and less hay consumed, and thus the proportion between the albuminoid food and non-albuminoids is changed.

I have said that the value of any system of feeding depends on the digestibility of the food as well as its character. If the latter were the only factor required to work out the result, it would be an easy problem. By experiment it has been found that the digestibility of foods and of elements in foods differs greatly in different animals, and in the same animals under varying circumstances. Averaging a large number of these experiments, we find for hay (timothy) as before, that the digestibility of the elements is as follows:

	Bu.	*Horse.*
Protein Alb.	57	62 per cent.
Fat.	46	20 per cent.
Non. Alb.—Carb.-Hy.	63	56 per cent.
Crude Fiber	58	42 per cent.

On an average, you will see that only about one-half of the amount of good timothy hay is capable of being assimilated and taken into the system.

When we take up the more concentrated foods, as cornmeal, linseed oil cake, and the like, we find them much richer in proportion to weight and more digestible. At the risk of being tedious, I will take yon over corn and cornmeal:

	German per ct.	*American per ct.*
Total dry matter	90.4	81.6
Protein.	15.2 lb	8.
Fat	3.8	3.
Non. Alb.	70.5	68.
Ash	.9	1.2
	90.4	
C. Fiber		1.4
Digestibility		81.6

Protein	78 to 85	per cent.
Fat.	63 to 76	per cent.
Non. Alb	91 to 94	per cent.
Crude Fiber	34 to 100	per cent.

When we compare these results we see two things prominently: First, the different quantities of each element; second, the different rate of digestibility on account of the different forms of food.

These are but a few of the lessons that we must soon learn and apply in order to succeed.

The third point to which I alluded was the value of the manure. This is a portion of the problem too often not taken into account. If we do by accident or otherwise feed a ration to our stock too rich or too strong in some of these elements in proportion to the others, the excrement, both liquid and solid, will show the result in increased value of those substances for improving the land. In our rough and ready style of American farming we have ignored the manure question. The fertilizers have been considered rubbish to be burned—waste to cast into the nearest brook to be washed away. Now, we are ready to purchase the commercial fertilizers to replace those wasted in days gone by. In older countries the farmers have been through this same experience, and to-day their strong men at their experiment stations are at work on these problems and have reached approximate results.

This work and its results have been the result of but a short period of investigation. In 1852, Dr. Wolff took charge of the first experiment station in Saxony. Dr. Johnson, in the 10th report of the Sheffield Scientific School, says the earliest work was "the feeding of sheep to ascertain the best sustaining rations," i. e., the best combination of food for simply maintaining the weight and condition of a mature sheep. In 1875, thirteen stations were at work on this question of cattle feeding, studying the scientific phases of the question.

These men wished to know how much of the food built up the system and how much went to waste. What would be the effect of letting one element remain constant and increasing one or more of the others. What elements and in what proportion of each are best for animals at rest, at work, or in the stall being fattened. These questions have been approximately answered, and tables published in a neat little manual with full explanations, entitled "Manual of Cattle Feeding," by Dr. Armsby, of the Connecticut Experiment Station. We may not, as an entire class, be ready to take up and utilize the knowledge given in this work I have reviewed, but remember that this question of "breeding and feeding," although settled for to-day in our circumstances, may require to be settled in the new light of different circumstances very soon, and in the light of all the science that can be brought to bear upon it. There is an economical feeding and a wasteful feeding, and, although the wasteful feeder does not lose all, if he carefully cares for his manures, yet the chances are that the careless, wasteful feeder is the man who moves his stables to get them away from his manure pile; or he has built his barn so that the yard runs to a stream, thus giving him good surface drainage for his fertilizers.

Our country is largely in a transition state, and the all-important question for each farmer present to answer is, "am I going to assist to make the future more bright and more prosperous than the past? Remember that you are the producers of our land. If you can make an increase of 50 pounds on every steer you turn from the farm with no greater outlay, that this represents a sum which, in the aggregate, will make a fine-showing. Calf, 10 months old, cost 4½ cents per pound, brought $39.50.

If you can so fertilize and till your fields as to raise 2 bushels more of wheat, or 5 of corn, per acre, you have done a noble work; and one, which if extended over our State, would represent an increase in money value of millions of dollars. This means an increased bank account for some—better buildings for others, more home comforts and perhaps some of the luxuries of life. It means the extra amount to send a son or a daughter away to school, and thus to give them better advantages than you possessed where you were, and the loss of which you feel so keenly, now. With more of these comforts and privileges, we should have a less number of our young people leaving the farms.

With this new era of farmers' institutes, farmers' clubs and farmers' organizations generally, may we not hope to see none but good improved stock upon every farm, the farms soon brought up to a high state of production, and the farmers' sons and daughters educated in the best industrial colleges in our land.

Ques. Have you ever experimented in feeding hay to hogs in winter?

Ans. No sir; but I have seen it done. Clover hay will keep hogs very well. It contains albuminates, which they need and want.

Ques. Is there or not feeding qualities in corn cobs?

Ans. In the cob itself there are some feeding qualities. The crude fibre has the same elements in it as starch or sugar.

Jesse Newsom. Would you advise feeding hogs three times a day?

Ans. That would depend upon circumstances. If fat animals would lie quietly, probably a late morning and early evening feed would be sufficient.

Ques. A great many of our fine hogs break down; what shall be done?

Ans. Feed them bone—ground bone; wheat bran is very good for that.

Ques. There is a belief among many farmers that high feeding among swine is the cause of hog cholera.

Ans. I don't think there is anything in that, provided you use good sanitary measures.

In this same connection the question was asked whether filth in the pen was not the cause of hog cholera, and the professor answered that he thought not, though the germs of the disease may be caused from other sources.

Ques. Do you consider fat a disease?

Ans. No sir.

Ques. There is an impression among farmers that ringing is the cause of cholera; that it prevents the hog from obtaining some necessary elements while feeding.

Ans. No sir; I don't think that's the cause, or has any thing to do with it.

After several other questions and answers on this subject, the professor at length said that carbolic acid is one of the best substances to kill the germs of hog cholera when given in minute quantities.

Then came a song:

"Take the spade of perseverance,
Spade the field of progress wide," etc.

Joel S. Davis then introduced C. L. Whitney, of Cincinnati, who proceeded to give an exceedingly interesting address, which we give in substance as follows:

Mr. Chairman and Ladies and Gentlemen:

I have no speech written out for the occasion. Born a farmer's child, reared a farmer's son, and spending the larger proportion of my life in close communion with nature's ways, learning nature's laws, I have come to regard the farm as among the chief institutions of our nation. I do not come before you to think for you. I could not, consistently with the teachings of my entire lifetime, for I never allowed man to think for me; I will never allow woman to think for me. Then I could not consistently come before this intelligent audience, presuming for one moment to think for them, for I believe, and I hold it to be the sacred duty of every man to think for himself, and of every woman to think for herself. [Applause.] I come before you to set you to thinking. You have heard that we have relative positions. Out of these relative positions grow relative duties, and out of these duties grow responsibilities. Such a thing as an independent man God never made. The material wealth of the world comes chiefly from the farmer's hands. He must needs employ the wealth that comes from the mines and the products of the manufactory. But until the farmer had first sought the soil and planted the tiny seed and carefully reared the tender blade and gathered in the harvest, there lacked the material for manufacturing into food and clothes.

Right here let me allude to this great question of transportation and the farmer's interest in it. When we ship our wool eastward we are shipping raw material in its crudest form, then when a manufactured article comes back we purchase it in an improved form. Instead, then, of shipping the raw material, manufacture it at home and ship the manufactured surplus When you ship real cloth you ship brains, the muscle and labor that have been used in the manufacture.

Another question; We are in the habit of saying that business is booming when the productive industries come prominently before the world. This is what is known in Michigan as hard times. Soon after these hard times pass, we begin to see these factories starting. By and by there begins to be a movement in business circles and somebody says, "Business is booming." Have heard the expression for a long time but gave it but little thought; and if it hadn't been for one of your Hoosier gentlemen going to Kentucky with me, do not know that I would have known what it did mean. I was in your State in the month of August, and as I always bring rain when I go anywhere [applause], I was sorry I didn't come before, for I saw your fields parched and burning. A day or two since I was with this same gentleman in the same city, and as I passed over that wondrous work of art, the suspension bridge, I saw that the lower stories of several buildings were being filled with water. I asked, "What are they using these lower rooms for?" "They are saloons," was the answer. Then I said, there is one time when the topers have left; there is too much water there. [Applause.] "Doubtless," says the gentleman, "there is a great deal of water there. The Ohio is booming!"

There is another question. "The question of what proportion of taxes do we, as farmers, contribute?" And, thereupon, the speaker emphasized that as the farmers paid the larger proportion of taxes they should watch with a jealous eye where these taxes went to. The question as to whose treasury it is, ought to come into the farmer's mind, and he ought to be alive to these questions at other times, besides at tax-paying time. "Why, we are the sovereigns," continued he, "we cast the majority of the votes also; we have the power to give the laws, and if we do not do it, we will be responsible."

Then he sought a definition for a ballot. "I will give you my definition. It is the material representative of a man's interests and principles." And the conclusion followed that if a man had no interest or principles, such a man would not care to vote, and would stay at home on election day and say: "They can get along very well without me there to-day." And on the question, whether we need so many lawyers and doctors, the question was not whether we need them or not, but the question is, "Do we need a surplus?" If you ask me, "Is there such a thing as too many lawyers and doctors?" I say no; there never will be. And then after saying a great many other good things, the speaker concluded by saying:

There are some questions that have always troubled me. One is this: Why a woman holding a farm, and paying her taxes every year, has not the right to vote, especially as Thomas Jefferson said that it is the basis of our government that there shall be no taxation without representation. This troubles me. For though the hired man can not read his vote, yet he can vote her rights away. [Applause.] And though that woman may have a college education, the best that Purdue or Michigan can give, she can not exercise it in making an intelligent ballot; but that poor man who can not read a word of his can vote. And thus I suppose we get our intelligent ballots. No, sir; some of the questions I can't understand, though I never was a women's rights man. The doctor sprung another question, viz: What effect the whisky trade has on the price of grain.

Now, if you ever want to settle that question in the right way, give women the ballot. [Great applause.] Will not there be trouble? you ask. No! Why? They will call the house to order. We settle it in our household in this way: We call the house to order. I always do that. [Laughter.] And then I will not allow my wife to get ahead of me in gallantry, and I appoint her chairman. [Laughter.] And then I propose the question and discuss my side of it, and then she discusses her side of it. Then I say, "I will give you the right to vote on this question." I then cast my vote and she casts hers, and, of course, there is a tie. [Applause and laughter.] But you know in every question of a tie vote the chairman decides it, and hence she always decides it right—every time. [Great applause and laughter.] I thank you for your courteous attention.

At the conclusion of this last address, Alex. Heron, Secretary of the State Board of Agriculture, arose and said:

Mr. Chairman—I am authorized, on behalf of the State Board of Agriculture, to tender their thanks to you and the citizens of this county for the interest manifested on this occasion, which has contributed so much to make the first trial Institute a grand success. Also, on behalf of the invited guests. And personally to express acknowledgment of the courtesy and kind hospitality received at your hands.

John Jones. I move, Mr. President, that a vote of thanks be tendered to the Secretary of the State Board of Agriculture, Professors Ingersoll and Wiley, and the other visiting brethern here in Columbus. Carried.

Dick Jones. Mr. President, I move now that the Institute extend a vote of thanks to S. R. Quick for his zeal and energy in securing this meeting, and I further move that this be added to the record. Carried.

S. R. Quick. I want to say to the Institute that we have employed a Short *Horn* reporter and he must be paid.

[Such a thunder of applause as followed this little slip of the tongue on the part of the worthy Chairman was never before known in the grand old north court room. And as the reporter had not quickness of wit to reply in the face of so much excitement he feels a secret exultation on remembering that he has one more chance, and he would now take this opportunity to inform his humorous brethren that he does *not* belong to that particular breed of—steers.]

Moved and seconded that the same committee be retained and authorized to receive the money and make the necessary arrangements for publishing in pamphlet form a verbatim report of the two days' proceedings of the Institute. Carried.

The Institute then adjourned.

FARMER'S INSTITUTE AT CRAWFORDSVILLE,

Held March 22 and 23, 1882, Under the Auspices of the Indiana State Board of Agriculture.

The Institute was called to order at 10:30 A. M., Wednesday, and on motion of P. S. Kennedy, Hon. Archibald Johnson, of Franklin township, was made chairman, and Mayor Ramsay chosen secretary.

PROGRAMME.

WEDNESDAY—MORNING SESSION.

10:00—Welcome by Hon. M. D. Manson.
Response on behalf of the State, by Governor A. G. Porter.
11:30—Address by Hon. H. C. Meredith, President of the State Board of Agriculture.

AFTERNOON SESSION.

1:30—Lecture by Prof. H. W. Wiley, of Purdue University, on "The Growth of Sorghum Cane and the Manufacture of Sugar and Syrup Therefrom."
2:30—Lecture by James A. Mount, of Montgomery county, on "How to Promote the True Dignity and Standing of the Farmer, and have the Youth Attracted to Farm Life."
3:00—Question Box.

EVENING SESSION.

7:00—Lecture by J. G. Kingsbury, of Indianapolis, on "Our Common Insect Pest."
8:00—Lecture by Prof. J. M. Coulter, of Wabash College, on "Relation of Geology and Agriculture."

THURSDAY—MORNING SESSION.

10:00—Lecture by Dr. R. T. Brown, of Indianapolis, on "The Selection of Seeds as a Means of Improving Crops."
11:00—Lecture by Hon. P. S. Kennedy, of Crawfordsville, on "Our Highways."

AFTERNOON SESSION.

1:30—Lecture by Prof. C. L. Ingersoll, of Purdue University, on "Some Thoughts on Ensilage."
2:30—Lecture by R. M. Lockhart, of Waterloo, Ind., on "The Fence of the Future."

EVENING SESSION.

7:00—Lecture by Harmon Hiatt, of Crawfordsville, on "Practical Gardening."

P. S. KENNEDY,
JOHN S. BROWN,
WM. Q. O'NEAL, } *Local Committee.*

GENERAL MANSON'S ADDRESS.

I have been appointed to bid you welcome in the name of the people of Montgomery county. We feel that we have one of the grandest counties in the State, and that Crawfordsville is a fit place to hold this Institute. Of all the occupations of man, agriculture is the noblest and most ennobling. To secure the greatest blessings, the farmer must have a thorough knowledge of his business, and meetings like this assist greatly in the advance of scientific agriculture. In thirty years the Indiana State Board of Agriculture has done a vast amount of valuable work. This late scheme of holding Farmers' Institutes is a good one. The State Board and the State Agricultural College should work together, and the people should appreciate their value and sustain them. The people of this vicinity ought to make the most of this opportunity. Again, in the name of the people of Crawfordsville and Montgomery county, I extend a hearty greeting.

GOVERNOR PORTER'S ADDRESS.

I thank you on behalf of the State Board of Agriculture for the cordial warmth of this welcome. It will be an incentive to it to prosecute with zeal the new work that it has undertaken. To hold fairs has been commonly supposed to be the business of the board. The more important duty assigned to it by law, of considering and discussing "the wants, prospects and condition of agriculture in this State," and of making an annual report thereon, has perhaps not generally been known. We have an agricultural college in the State, with a corps of able professors, who have been modestly and diligently engaged in their labors for several years, and the college has been growing in favor through the impression made by students whom it has been sending out. But neither the State board nor the college has received or imparted the advantages which they might have done had their work and methods been more generally made known. They have therefore decided that they should bring themselves more in contact with the farmers of the State, and freely interchange knowledge with them. They have come here to be instructed not less than to instruct. It is a meeting for consultation on subjects which most concern farmers. Every man is invited to speak and to put questions.

The Governor, who is not a member of the State board, nor connected with the Agricultural College, has been invited here to respond to the citizens' salutation, just as if the secretary of the board was too modest to rise and say, "Thank you." The governor suspects that he was invited here to help to swell the crowd [laughter], and, to tell you the truth, that is what he came for. [Laughter.] If his presence would at all contribute to that end, he thought it would be for the audience's benefit, and the board's also. The greater the crowd the greater the number of people whom the gentlemen appointed to address you will instruct, and the greater number of people will in turn instruct them.

The State board has quite undesignedly furnished me a theme by a resolution which it recently adopted. That resolution is that the legislature be asked to confer authority upon the governor to schedule cattle being shipped into and through the State, and that stock coming from the regions of country infested with pleuro-pneumonia may not be permitted to locate within or pass the State lines.

The proposition to confer upon the governor of the State so extraordinary an authority has excited reflections which have led me to adopt for a theme "New Diseases among Live Stock, and the Duties of Farmers in Relation to Them."

That there has been, in recent years, a great increase in the number of diseases among domestic animals, is the common expression of agricultural writers. No doubt a chief reason for this grows out of the great increase of railroads, by which animals and even injurious insects, which used to be kept within an exceedingly limited region of country, are now distributed through great distances. Diseases of animals, from being local, thus become widely diffused and general, and a disease which otherwise would have been confined to a neighborhood, is spread over a whole country.

But making due allowance for the introduction of what seem to be new diseases by the spread of old ones, there can be no doubt of the extensive development of actually new diseases from new causes incident to the change in the structure, conditions and modes of life of domestic animals. The hog was, quite within the recollection of elderly men who are here, an only half domesticated animal. The male had tusks to enable him to contend with enemies while seeking for food. The limitless woods were his range. The variety of his food was great, for he ate whatever he could find which was suited to his much appropriating appetite. By an instinct directing him how to alleviate suffering or disease at its approach, he craved medicinal plants, which the woods furnished plentifully, and he ate them freely, and was thus his own physician. We see the dog eat grass and the cat eat catnip for the same reason. His food was coarse, and indigestion, with the brood of diseases which it admits by the degeneration of health, was scarcely known. He is by nature of a carnivorous as well as a graminivorous habit, eating worms, shells and all animal matter he can get, the female often eating her own young when other animal food is inaccessible. He found these in his range, in streams, on the surface of the ground, and beneath it, and he ate of them habitually and plentifully. He fed upon no concentrated food, or food artificially prepared. With a skin acutely sensitive, he was able to wash off insects or irritating substances in running waters, or kill them by wallowing in muddy pools. His shape was strangely different from that of his fellows now. It was adapted to the conditions of his existence as they then were. His snout was long, in order that he might plow deep into the earth for vegetable and animal food. His long tusks and his strong shoulders prepared him for combat—whether of onset or defense—and his long limbs for rapid flight. If he was changed from place to place, he was driven upon foot, was sufficiently fed on the way, walked upon the healthy soil, and breathed an uncontaminated atmosphere. If sick, the limits of his travel being short, he did not spread disease beyond very narrow bounds.

Now, witness the changes that have been wrought. The tusks, his sword for assault and defense, have diminished. His shoulders, so stout to propel him in onset, are reduced in size. His snout is reduced in length, so that he can plow but a little depth. His food is limited to one or two varieties—often not in the natural state—often deprived of some of the properties necessary for the maintenance of some of the organs by artificial processes of the distillery or starch factory, or other place. Medicinal plants to which his instincts direct him are inaccessible. A supply of animal food is almost wholly wanting. Pools are often deficient in which to wallow to destroy injurious insects. Streams in which he may freely wash his extremely sensitive skin are often inaccessible. Insects, by being imported from their old habitats to new ones, increase in number everywhere, and thus additionally worry him. Man, by a system of skillful breeding of animals as full of ingenuity as the highest mechanical invention, has robbed him of nearly every characteristic which qualified him for his original state. His snout has been shortened to nearly none, and is often artificially deprived by a ring of its little remaining function; his shoulders diminished; his hams prodigiously increased; his sides greatly lengthened; his back made perfectly straight, instead of being curved upwards; and he has been converted into a frame-work to hold up a mass of salable flesh and fat, until the slaughter house kindly allows him to unload it.

Is it strange, with all these changes so radical and amazing, that he is more susceptible to disease, and subject to a greater variety of diseases, than he was in his natural condition?

The remarks about the swine will apply, with but little change, to horned cattle. In the writings of naturalists, and of agricultural writers, we learn how wild their habits were when the woods were their accustomed home; how they were shot when needed for food instead of being driven to shambles; how walls, instead of fences, were built to confine them; how they subsisted upon natural grains; how they browsed upon trees; how their instincts drove them to the medicinal waters, and other agents provided by nature, within the ranges in which they roamed; how they had long horns and heavy shoulders for defense and combat. How all this has been changed. Everywhere the high breeds are short-horned, and lately the hornless begin to be preferred. They are penned up within narrow limits. They are fed largely upon artificial foods, given rather to fatten than to maintain the healthfulness and development of the several organs. They are kept as still as possible, and thus deprived of their natural exercise, in order better to retain flesh and fat. Their heads are made smaller, their limbs shorter, their shoulders lessened, their sides lengthened, their hind-quarters enlarged, their backs made straight as a horizontal line. With liabilities to disease multiplied in the many ways suggested and appearing in unaccustomed forms, they must be met by a degree of vigilance and knowledge commensurate with the ingenious intelligence, energy and progress which have caused all these changes in the conditions of animal life to be brought about. As in times of great public calamities by flood or fire, contributions are made for the relief of sufferers from every nook and neighborhood; in like manner, to meet the calamaties of brute disease, contributions of knowledge must be made from every quarter where disease exists. Not contributions of theories, for they are worse than nothing, and more frequently aggravate existing troubles than cure them, but accurate contributions of facts. In every particular neighborhood where disease exists every condition from which it could have sprung should be independently scrutinized by every farmer. Farmers should then assemble and carefully compare observations. They should scrutinously canvass the facts reported, and consider whether they may not, in some cases, have been inaccurately observed, and thus tend to mislead rather than to instruct. They should see what facts existed at one place which have been supposed to be material, which did not exist at a place where the disease was equally prevalent; and they should thus eliminate the unimportant ones; and, being accustomed to the appearance of the organs of healthy animals when slaughtered, they should examine the organs of diseased ones, and, so far as their skill will allow, note the differences. They should be slow to jump at theories, which often prevent an impartial collection of facts. When they have carefully determined by this system of comparison of one another's observations, what facts, which it is supposed have relation to the disease, are common wherever the disease exists, they should carefully report them to the Secretary of the State Board of Agriculture or to the Chief of the Department of Statistics, to be preserved and compared with the facts reported elsewhere. From such a mass of carefully collected observations, veterinary science could comprehend and diagnose the case more accurately than it has ever been done, and determine the type of the disease and the remedy. If this practice were pursued over the whole land by the persons most interested—the farmers—it would be but a little while until efficacious remedies could be found for the several diseases of live stock when they occur, and, what is very much better, the conditions could be prevented or avoided out of which the diseases spring. The ease with which diseases can be prevented, by ascertaining the circumstances out of which they arise, should stimulate all farmers to be alert to ascertain the circumstances.

The Department of Agriculture at Washington keeps seven or eight agents at the great live stock markets, to examine diseased stock, and to ascertain the origin of prevalent maladies. They have collected many valuable facts, and deserve to be much commended; but, from the nature of the case, they can not get the best knowledge. The facts they collect are often or generally second-hand, not submitted to the tests which I have suggested, and are not the result of a prolonged and minute investigation which each farmer can give in the case of his own stock.

Less than any other class of intelligent men are farmers accustomed to association for mutual discussion of what concerns their interests. This has happened from their separation from each other by distance, from bad roads, and often from want of help, which has not seldom confined them to the manual part of their work at the expense of the intellectual, which would have been more profitable. They should learn the benefit of association, and of communicating to each other their observations and knowledge, and they should form the habit of bringing to the knowledge of all who are concerned in the same occupation the facts not generally known, which concern the profits and successful conduct of their business.

There can be no prevention and no certain cure of the prevalent diseases among the domestic animals of the country until all the facts which will throw light upon the origin of these diseases are carefully gathered and compared, so that the conditions which have produced the diseases shall have been trustworthily established. Every farmer among whose domestic animals diseases exist should examine into every condition which might have produced them, and the neighborhood should communicate them in such manner as to add to the general stock of knowledge. With all facts carefully collected and made trustworthy by the tests which I have above indicated, it would not be long until the number of diseases among domestic animals would be greatly diminished, by adoption of proper means of prevention, and those unpreventable would be rendered more generally curable.

In this land of common schools; in this country where newspapers circulate more generally than in any other; where good libraries are accessible in nearly every neighborhood; where competence and the leisure consequent upon it are now more generally distributed than anywhere else on the globe, every man ought to feel that his responsibilities and duties are increased in proportion to his advantages, and that it is incumbent on him to contribute to the general stock of useful knowledge.

It is interesting to be on this ground—long the home of Henry S. Lane, the spirit-stirring orator, the faithful public servant, whose grave is yet fresh and whose memory will dwell here for generations; where repose the honored remains of Caleb Mills, the father of the common school system of Indiana; where lie the ashes of Dr. Charles White, the most conscientious and faithful of instructors; the loved residence of General Manson, a citizen who has survived two wars in which he bore a heroic part, and who has rendered faithful service in many civil stations; the resting place of Isaac Naylor, who long presided as a judge among you, and whose plain face grew dear to those who experienced the warmth and constancy of his personal friendship or beheld how clear he ever was in his judicial office; once the home of other men prominent and useful, of whom time only forbids particular mention; the place where shines the private munificence of Edwin J. Peck, simple in all his ways, faithful to every duty, who was almost the father of the railroad system of this State, and who made the stock of the railroad with which he was connected valuable by administering his office, as if it were a sacred private trust, in the interest of all the stockholders; the seat of a college whose spires, pointing toward heaven, are an emblem of the aspirations of many noble young men who have been honored with its titles of scholarship; a county blessed with a prolific soil, an intelligent population, simple habits of life and an open-hearted hospitality which fitly crowns it all.

It was to be expected that such a county would take an interest in the new work upon which the State Board has entered, and that expectation has not been disappointed.

ADDRESS BY PRESIDENT MEREDITH.

H. C. Meredith, President of the State Board, delivered the following response. He said:

The importance of agriculture has been recognized by all nations. Its progress marks the advance of civilization; its decay is the ruin of a people. The especial encouragement given to this cause in Indiana by the Legislature has paid. It was but thirty years ago that legislative provision was made for the agricultural organizations of the State, yet much has been accomplished. The State Fair does not represent all the work done by the State Board by any means. In 1854 it engaged the services of Dr. Brown as State Geologist before that office was created with legislative sanction, thus inaugurating in this country the special work of the said office. The voluminous reports issued embrace a wide variety of knowlege of practical importance. Here in Montgomery you have one of the best counties in the State; yet in the course of time your land will be worn out unless special care be taken to prevent it, and to secure the best results in all departments you must have educated labor and intelligent supervision.

THE GROWTH OF SORGHUM CANE AND THE MANUFACTURE OF SUGAR AND SYRUP THEREFROM.

BY PROF. H. W. WILEY, OF PURDUE UNIVERSITY.

It has been about twenty-five years since the culture of sorghum was introduced into this country. As is well known, it is a native of Africa and China. During the civil war the culture of sorghum became very profitable. At that time the only variety cultivated was known as the China sorghum cane. After the war the culture of sorghum cane declined. This was due to different causes. One of these was the fact that the cane fields of Louisiana were opened again to northern consumers. Second, the sorghum syrup made at that time contained an unpleasant flavor, known as the sorghum taste or green taste, which was very unpleasant to many persons. This led to the gradual exclusion of sorghum syrup from our markets. So that from 1867 for a period of ten years the culture of sorghum cane in Indiana was almost discontinued. Nevertheless, during all this time here and there scattered over the country small mills might be found, and small patches of cane growing. In regard to the growth and culture of sorghum cane I would say that special attention must be paid to the selection of the seed. Of the many different varieties which are now in cultivation, an extensive series of experiments have shown that the early orange and the early amber varieties, especially the latter, are best adapted to our climate. In the selection of seed those heads which mature first and are of the largest growth, and whose stalks have the sweetest juice, should be selected for seed. Care should be taken also that the different varieties should not mix, and especially that the cane should not be planted near broom corn. In regard to the cultivation of cane but little can be said, only that it must be cultivated just like corn It should be planted, if the ground is clean, with a drill, or, if the ground is foul, in check rows. It should be planted early in the season—part of it, and part of it later, so that the working season should be made as long as possible. Early amber seed, when planted the latter part of April or first of May, with a favorable season, will be ready for working by the 10th of August. By planting seed from the 1st to the 25th of May, and by planting the early orange and the early amber, the working season may be extended from the middle of August to cold weather. Cane, when it first comes up, should be carefully attended to with the hoe.

The seed should be planted about five pounds to the acre. All seed for planting should be tested to see if it will grow. An imperfect seed should not be planted. After the cane comes up, if the cane is too thick it should be thinned out, so that about five or six stalks would remain in a hill. The stalks should be about ten inches apart when in drills. Care should be taken not to plant the seed too deep – about half an inch is the proper depth. The seed, before planting, should be soaked from twenty-eight to forty-eight hours in warm water. The cultivation, except in hoeing, is exactly the same as for corn. The cane should be harvested as soon as the seed becomes so hard that it can not be crushed with the thumb and finger. If the cane can not be worked at this time, it should be cut and stacked under shelter, so as to be protected from the changes of temperature, which at this season of the year are very great—the days in August and September being usually very hot, and the nights very cool. These sudden changes of temperature induce fermentation. But if the cane is stored under shelter so that it contains an even temperature throughout the day, it may be kept six weeks or two months without suffering material injury. Cane should never be stripped and topped and left standing in the field. It should be cut and hauled and placed under shelter until it can be worked. It is preferable to work the cane as soon as cut, if possible.

In regard to the manufacture of sugar into syrup a good mill should be used. The very best mills may not extract all the juice. The only way in which the whole of the juice may be extracted is to use the depurating process.

This method has not yet been extensively introduced for sugar cane, but for the sugar beet it has entirely displaced the old mode of rasping the beet and pressing by hydraulic pressure. After the juice is expressed it should be treated with lime water made from pure lime, until it no longer reddens litmus paper. This is done to neutralize the free acids which are present in the juice. These free acids, if left in the juice, cause the crystallizable sugar to be converted into non-crystallizable during the process of evaporation. Hence, if we wish to obtain sugar from the juice it is absolutely necessary that these acids be neutralized. After the lime has been added the juice is next conveyed to the sulphur tank where it is mixed with the fumes of burning sulphur. This prevents fermentation, bleaches it and gives a lighter colored syrup. The evaporation should take place if possible in pans furnished with a steam coil. It is always unsafe to evaporate over a fire train, owing to the danger of scorching. It is best that the steam coils be made of copper, though iron may be employed. The first pans are called defecators. In these the juice is heated, and the scum raked off the top, not while boiling, however. Every particle should be allowed to settle to the bottom. The juice should be of a light amber color. It should then be drawn off into the concentrating pan. In these pans it is concentrated until it is reduced to the condition of semi-syrup. After it has reached this condition it is drawn off into the finisher where it is concentrated to the consistency desired. The best results are reached if the finisher should be replaced by the vacuum pan. The vacuum pan is the instrument by means of which the boiling can be carried on at low pressure, and thus at a lower temperature. This is done by having a vessel something in the shape of an egg, with steam coil on the inside connected with an air pump. When the air is exhausted on the inside the syrup will boil at a temperature much lower than water. By this means the concentration is effected at a very low temperature, thus all danger of scorching or destroying the crystallizable sugar by high temperature are avoided. We have then as a summary of the manufacture of the syrup: First, the expression of the juice; second, treatment with lime; third, treatment with sulphur fumes; fourth, defecation; fifth, concentration to semi-syrup; sixth, finishing in the finishing pan or vacuum pan.

There are two kinds of sugar in the juice of the sugar cane: First, ordinary cane sugar and crystallizable sugar; second, invert or non-crystallizable sugar. In the cane the average structure will contain 12 per cent. of crystallizable sugar, and 2 or 3 per cent. of non-crystallizable sugar. It should be the object of the manufacturer to secure the whole of the crystallizable sugar unchanged in the end. If the sugar or syrup is to be refined, animal charcoal filters are employed. This animal charcoal is made from the bones and sometimes from the blood of animals. It possesses the property of discharging from the syrup its color, and removing from it any unpleasant taste it may have, so that when the product is finished it is of a light amber color, of a pleasant flavor, commanding in the markets almost double the price of the crude syrups. In regard to the product it may be said that land which will produce fifty bushels to the acre of corn will produce from twelve to fifteen tons of cane, forty bushels of seed and one ton of blades. The cane will produce from fifteen to eighteen gallons of syrup to the ton. Each gallon of syrup when properly made will yield from five to eight pounds of sugar. The yield of sugar is from 600 to 900 pounds per acre. The yield of syrup from 75 to 100 gallons. The blades are worth as much as hay, pound for pound, and the seed is worth as much as corn, containing from 6 to 8 per cent. more starch than corn, and it can be used for making glucose, for feeding stock, and even has been used for buckwheat cakes, making excellent meal. It is well established that the seed and blades, if properly preserved, will pay all the expense of raising, harvesting and delivering cane to the mill, so that the profits from the cane may be regarded as pure gain. This cane at the mill is worth two dollars per ton, or can be exchanged for five gallons of good syrup per ton. Then the profits on an acre of cultivated cane, clear of all the expense of raising, harvesting and delivering, are equal to twenty or thirty dollars. Farmers in raising cane should waste nothing. Blades and seed and cane should all be carefully preserved. Begasse, which is the refuse after pressing the cane through the mill, makes excellent paper, or if treated with water makes excellent vinegar, or it can be burned in the furnace as fuel. The scum which is removed from the evaporating juice makes excellent apple cider vinegar, and should never be wasted. If not made into vinegar it should be fed to the hogs, it will fatten a hog quicker than anything else.

Each individual farmer should not make any attempt to manufacture sugar himself, but farmers should club together and put up the central works capable of working from 300 to 500 acres; then all should contribute something to its support. A manufactory capable of working from 300 to 500 acres can be put up for about $7,000. Farmers who attempt to work themselves of course can not go to the expense of boiling with steam, or of getting the best quality of mill or of taking care of all the products in a proper way. The profits of all parties concerned are greatly increased by working for the central mill. The sugar supply of our country is a problem of the greatest importance. Each individual in our country consumes annually about five dollars worth of sugar. Thus the total sum expended for sugar amounts to $250,000,000 per year. Sugar is not merely a condiment, but is of itself a valuable food. The food which we call starch is indigestible and is converted into sugar before it can be absorbed into the system. Thus if we eat more sugar and less starch we lessen the labor of our digestive organs to that extent and thus avoid indigestion and dyspepsia. This will tend to lengthen life. Therefore anything which increases the production of sugar or makes it cheaper or causes it to be made at home, not only increases the material prosperity of the country; but it is also a work of civilization, for it is well known that the consumption of sugar and the progress of civilization go hand in hand. Of the total amount of sugar that is consumed in the country only one-twelfth is produced at home; the other part of it is imported. Thus we send out of the country annually $200,000,000 for our sugar supply. I believe it possible that all this sugar can be made at home. Along our extreme northern belt the sugar beet can be successfully grown. In all the great corn growing regions the sugar cane can be made to yield an immense profit. Further south the supply can come from the tropical cane. Thus if we would properly take hold of this matter and encourage the cane industry I believe that in less than a quarter of a century the farmers of Indiana will make all the sugar necessary for the State. Thus the greatest material benefit may result to all parties concerned. If you wish to make the experiment, club together and put up a central mill. It will cost each of you but a small sum. Then you will be able to test the capabilities of our soil for the production of sugar. In Kansas, Minnesota, Iowa and New Jersey these experiments have all been made and managed successfully, so that it may no longer be regarded as an experiment. It is fully believed that the cultivation of the sorghum cane can be made twice as profitable as wheat or corn.

Question. What is the difference between glucose and sugar, and can they be converted into each other?

Prof. Wiley. In answer to that, I will say that they are both varieties of sugar. Glucose is a variety of sugâr, and there is another variety, and they have not been interconverted. I brought some specimens of starch glucose with me, expecting perhaps that this question would be sprung. We have two forms of it in commerce—a solid form, of which I have a lump here, where it crystallizes or solidifies, that is ordinarily known as grape sugar in commerce. This is made from starch in immence quantities in this country. Fifty to one hundred thousand bushels of corn are consumed in a day making this starch, and it is sold as grape sugar. If it is made from starch and is liquid, does not solidify, it is called glucose. In this bottle we have a little. This is a beautiful syrup, it is like honey in its looks and structure. (Handing the bottle to Governor Porter.) Governor, I believe you stated you did not like my lecture because you could not taste the specimens. [Laughter.] You see it is almost as clear as water. They mix this with deeply colored syrup to form the ordinary syrups of commerce.

I have here what is called "B" syrup. They are graded and the grades are represented by letters. A is the lightest, B is of a deeper color, and so on down. These are almost the only ones you can find in the market. They mix these highly colored syrups with the refuse of the sugar refineries. If you could see this imported raw sugar from which our refined sugars are made, and from which syrups are made, it would be a wonder to you that they could ever be made edible. These raw sugars are really repulsive to the taste and to smell. Yet, from these raw sugars are made these fine sugars and the sugar syrups, which are mixed with glucose and form the ordinary mixed syrups of commerce. They sell them by color, and some of the sugar-house syrups, as they get into deeper color, are of less value. The more they have of pure glucose the higher the value.

They make this grape sugar very fine and white. Here is some of this grape sugar granulated for the purpose of mixing with cane sugar for the purpose of selling. You can not convert them into cane sugar; they are chemically almost the same, however. You subject them to chemical analysis and you find they are composed of carbon, oxygen and hydrogen, and one constituent of water.

Sugar, chemically, would be very finely powdered charcoal mixed with water. You have chemically the same substance that you have in sugar, although they do not contain the same sweetening power. A great deal has been written in regard to glucose. You have been told, doubtless many of you, that it is extremely poisonous and deleterious to health. There is not a word of truth in anything of that. Of course you can make this product so as to make it poisonous, because it may not be well made. I am speaking of glucose that is well made. I know the gentleman that made this glucose. I know just how it was made. I know that there is nothing in it that is injurious to health. Just as good as honey and better so far as health is concerned, and just as wholesome as any sugar that was ever made. Its sweetening power is not so great. You understand it is made from ordinary corn starch. It is made by boiling it in oil of vitriol or sulphuric acid. The action of the acid on this starch is to convert it into this kind of sugar. Chemically starch and sugar are almost identical. I could not explain this without going into a chemical analysis.

Governor Porter. Is that what you make this honey from, that is not to be distinguished from the honey of the bee?

Prof. Wiley. Yes, sir. This is the honey just as it is; it is an excellent article of honey. Switzerland is said to bé a great honey country. I went all over Switzerland, and never saw a bee. Americans go over there and get honey for breakfast. The honey they get there is made over here in Peoria and shipped there. I don't believe anybody, except a person who is well schooled, can detect this from natural honey. You can get thirty pounds from every bushel of corn. It has been sold as low as two cents a pound. As honey you can get as much as fifteen or twenty cents a pound for it.

Ques Why does cane sugar sell for ten cents wholesale, and I can buy very nice sugar from eight to twelve cents; what is the difference?

Ans. Coffee sugar, ordinarily sold, has about 85 per cent. of sugar: pure white sugar, made from cane, has 96 per cent.

Ques. Did I understand that the dark specimen was deleterious?

Ans. No. I say they mix this with the syrup which is the refuse of the sugar refineries. That syrup contains all the impurities in the original.

Ques. I was reading an article, some time ago, on this glucose. I am very glad to be enlightened upon it. I thought from that article that glucose was made from old boots, soles of shoes, rags, and such things as that I am really glad that I have information upon the question, and will buy hereafter if I know it is pure glucose.

Ans. I suppose you thought old boots was the sole source. [Laughter.]

Mr. Lockhart. A large number of persons in Germany were engaged in manufacturing beet sugar. They had friends living in Wisconsin. They learned that the sugar beet grew very large there; they came out, raised money to build a factory costing $75,000, and yet it is standing idle to-day. They started up one season and failed to make sugar successfully. I know you can explain the reason why.

Ans. I think you are assuming a great deal. There are many reasons why companies fail. It might have been from mismanagement. I have given this subject a great deal of attention. I have visited two factories. There are not many in this country. One in Portland that has moved to Central New York, and one in Franklin, near Boston; this one I spend a great deal of time with. The trouble there was they could not get the beets. Massachusetts will not grow beets. The roots strike the granite rock before it can get long enough to grow. That would not be a reason for a failure in Wisconsin.

Mr. Lockhart. The nature of the beet was entirely changed. It lost its saccharine nature, and it would not make sugar.

JAMES A. MOUNT'S ADDRESS.*

After the close of the discussion upon sorghum, James A. Mount, of Shannondale, delivered an eloquent and forcible discourse entitled, "How to Promote the True Dignity and Standing of the Farmer, and Have the Youth Attracted to Farm Life." He said that there was need of a radical change in farm life and methods, that there must be more intellectual culture among farmers, more attractiveness about rural homes, more intelligent labor and less humdrum drudgery. The disposition of country boys to seek over-crowded city callings can be checked only by rendering farm life more attractive in some respects, and by the elevation of the standing of the farmer in the community. There is no need now in Indiana for the farmer to "toil and moil" as in the early days of the pioneer. We might as well take life comparatively easy, and by attention to the beautifying of home, render the farm more attractive. Agriculture to-day offers in Indiana greater wealth than all the mines of Colorado. Farmers should be educated, so that they shall stand well in the community. Then the boys would not be so likely to long for the quick gaining of wealth by speculation. For health, happiness, long life and true independence, farming is the best of callings.

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* We regret not having a copy of the Address to publish it in full.

QUESTION BOX.

After the conclusion of Mr. Mount's lecture the "question box" was opened.

Glucose and sugar was the subject of the first suggestion. Glucose is a kind of sugar, but the two have not as yet proved interconvertible. Glucose is not, as has often been asserted, deleterious.

It was stated that for fifty years the sugar-beet was a failure in Europe, and before full success can be expected in this country must be thoroughly acclimated. Ground should not be treated with fresh manure. Along the northern belt of this country ought to become a valuable crop.

Prof. Coulter, in response to question, said that blue grass proper had but one variety, according to the botanies.

Clover should be sown between the 1st of March and the 1st of May. Often very good results when sown over light fall of snow; sometimes, however, interfered with by later frosts.

Potatoes will not mix except from blossom. Then innumerable varieties may be produced. Very few good for anything, however. No danger to potatoes in using Paris green to oppose the festive potato bug.

Watermelons and pumpkins will mix.

Apple orchards were also discussed. It seemed to be the general opinion that insufficient care is taken.

BLUE GRASS.

After the completion of the morning programme there remained yet half an hour before noon, and Mr. Meredith was requested to enlighten the Institute upon the subject of blue grass. In substance, he said: Blue grass can be raised in Indiana, as well as anywhere. Can be raised on almost any soil. In sandy soil, however, the roots do not hold tight, and are pulled up. Clayey soil is the best. It is the most valuable feed that any farmer can raise. The farmer should never pasture during the summer where he intends to do so during winter, nor during winter on what he intends to use during summer. Blue grass will grow at all times of the year. Keep all the fence corners clean; don't let ragweed grow. If your blue grass is doing badly, don't plow, but take off your stock, and distribute stable manure. It takes a long time to start a blue grass pasture. One thirty years old is better than one twenty, and one twenty much better than one ten years old. In seeding at first it is well to use a third each of blue grass, timothy and clover. Don't be afraid of getting the seed in too thick. It is well to plant in corn field after last plowing for corn. As a general thing it will grow where any other grass can be grown.

EVENING SESSION.

The meeting convened at about 7:30 o'clock.

OUR INSECT PESTS.

The first thing on the programme on Wednesday evening was a paper by J. G. Kingsbury, of the *Indiana Farmer*, on "Our Common Insect Pests."* It was not only instructive but highly entertaining, even to those unfamiliar with the subject. Mr. Kingsbury possesses the art of imparting information in a witty and vivacious manner. The field of "bugology" is an immense one. Three-quarters of a million different species of insects have been described. The speaker took up the most common ones with which the farmer must contend, discussed their habits, and suggested various ways of destroying them.

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* We regret not being able to publish the address in full.

RELATION OF GEOLOGY TO AGRICULTURE.

BY JOHN M. COULTER.

There are some subjects which call to their proper consideration almost every department of science. This is eminently true of both the sciences mentioned in the subject of this paper. Geology has been called the cap sheaf of all sciences, for it demands a knowledge of almost all others, thus grouping them together and resting upon them. But agriculture is even more sweeping in its demands, for there is no department of science upon which it does not levy tribute, and even the "cap sheaf" must yield its quota of grains, that the great "bread and butter" science may be properly established. There is no more hopeful "sign of the times" than the mutual appreciation existing now between the theoretical and practical workers in science. I use these terms not in their strict sense, but in the common usage, which should substitute the more appropriate terms "workers in pure science," and "workers in applied science," for both classes are practical workers. For this reason you are ready and willing to listen to some of us who never stood between the handles of a plow or cultivated a single acre of ground, but who are devoted to the study of pure science, and are only too willing to come and lay at your feet any of the results of our study that may be of service. This interdependence of all sciences is increasing as knowledge increases, and in no department is there greater need of a fundamental knowledge of a great range of subjects than in that of agriculture. The time has past when we accept either methods or ideas because they have been handed down to us from our fathers. This practical age must put everything to the test, and thus it is that old absurdities are being discarded, and new methods and ideas accepted if they prove fruitful. Perhaps you look to botany and chemistry as related to you by the most intimate ties of friendship, but it shall be the object of this paper to show that geology also must be admitted to this inner circle of acquaintances.

Geology is continually searching for the beginnings of things, and in its application to agriculture, its first question is, "whence comes the soil upon which all your operations depend?"

In order that this may be clearly understood, we must hastily consider the general structure of the earth. The frame work of the earth is rock, and no where is this lacking. In some places the rocks are exposed to view, and in others deeply covered by the overlying soil, but dig where you will, you must sooner or later come to a solid rock foundation. Nothing in science is better established than that these rocks have all been deposited under water; that they are simply consolidated sediments, such as all moving waters to-day are carrying and depositing. If you examine the banks of any stream, you will find that the material it has brought down during freshets is generally nicely sorted and spread out in even layers—*stratified*, as it is called. Digging into this stratified sand and gravel, you will find all sorts of evidence of its having been deposited "along shore." There will be wavy lines that you know are traced by running waters; there will be the footprints of various animals; there will be muscle shells imbedded, maybe the carcass of a fish, sticks, bones; in short, all the varied collection to be found upon a beach, especially of a large river or lake. Now, apply these facts to the rocky cliffs found bounding our supposed river or lake valley, and see the irresistible conclusion. There are the rocks, neatly stratified and sorted into layers, just as completely as the sands down along the beach. Splitting them open, you see the same wavy lines made by running water, tracks of animals, imbedded shells, bones, plants, etc., of all kinds to be found upon a beach. Of course the conclusion follows, these rocky cliffs were once but unconsolidated sands, lying on the beach or in the bed of some stream or body of water. You would further notice that the footprints, the shells, the bones, the plants, by no means resemble anything in your experience of existing beaches, and hence the inference would be, that when these rocks were sands, at or below water level, very different kinds of animals and plants were living. And if it could be shown, as is generally the case, that these imbedded shells are sea shells, and not river or lake shells, you would be driven to what may seem the most surprising conclusion of all, viz., that these rocks once formed the beach or bottom, not of a river or lake, but of a sea! We are thus led to one of the fundamental principles of geology, that nearly all rocks are but consolidated sediments. The question may then arise, where did these sediments come from? Where do the sediments of to-day come from? They are simply ground off, by atmospheric or stream action, from existing rocks. Hence it follows that all rocks must have come from pre-existing rocks, and so we can trace this material back from sediment to rock, and from rock to sediment, until we reach the primitive crust of the earth. So far as we can tell, none of this first crust or rock is now existing, but it has been worked over and over again in fashioning the surface features of the earth as we find them to-day.

Thus it is that nature delights to work in great circles. Particles of moisture hang suspended in the atmosphere, are distilled into drops which fall as rain and run off into the streams, are carried along and presently find their way to the sea, from whose bosom they are lifted into the air from whence they came. So numberless instances could be given of this same law, but none better than those circles, half of whose circumference is represented by rock, and half by sediment. Have we not then come upon an answer for the question, "whence comes the soil?" It has come from the grinding up of the rocks. You can safely rely upon the statement that all soils are disintegrated rocks. But now comes the question, "How?" Broadly speaking, all stratified rocks may be grouped into three classes, sandstones, limestones, and clays, and these three may exist in all degrees of consolidation; for instance, sandstone rocks may range in compactness from the loose sand on the beach to granite; limestone rocks, from chalk to marble; clays, from mud and shale to slate. Do not understand that there is commonly such a thing as a pure sandstone, or a pure limestone, but simply that in the one case sand is the predominating ingredient, in the other, the lime gives the character. The fact is that nearly all rocks are more or less mixtures of the three kinds, and it becomes very difficult sometimes to determine which name we shall apply. Thus as we may have all kinds of rocks by the various combinations of the three elementary kinds, so we may expect all kinds of soils from their disintergration, but soils which can also be reduced to the three elementary kinds, and called sandy soils, limestone soils and clays.

Imagine, if you can, that every particle of soil has disappeared from the earth, and that naked rocks form the only features of the landscape. It would be forbidding enough, and no man or animal could live, but at once certain powerful agencies would come into operation which would eventually change the whole face of nature and bring about the features we see to-day and prize so much, the rich valleys and plains, the dense forests, the consequent presence and works of man, the endless features so common in our experience, but all due to the existence of soil, to the fact that the rocks are not naked everywhere. The mighty agent which can produce such a change is water, either as vapor suspended in the atmosphere, or in running streams, or in the form of ice. Our naked rocks are, as we know, nothing but consolidated sands, the grains bound together by some cement. The moisture in the air, bathing universally all exposed surfaces, is most general and most effective in its work. It gradually finds its way into the rocks, either because they are porous or because it can dissolve certain of their constituents, and there freezing and expanding it wedges little particles off and soon the whole surface of rock, as we say, "begins to crumble." This crumbled rock is nothing but the first step toward soil. It may be rendered finer by repeating the same process, or oftener in another way. All of this rock material is composed of two kinds of constituents: those which are soluble and those which are insoluble, and these two ingredients are so thoroughly mixed together that when the soluble is dissolved out, the insoluble is left as a fine powder. One example will suffice. One of our common rocks is granite. It has three constituents, quartz or sand grains, feldspar and mica. The quartz and mica are insoluble and hence the water can only attack the feldspar. But the feldspar itself is made up of two ingredients, silicate of alumina and silicate of potash or soda, and the silicate of alumina is insoluble; so that all that is left in our granite rock that can be acted upon by water is the silicate of potash or soda. Suppose that this ingredient has all been washed out and the heap of dust which will be left will be composed of the insoluble ingredients, quartz, mica and silicate of alumina. Silicate of alumina is but another name for clay, and quartz stands for sand grains; so that our granite has weathered into a soil made up of clay, sand and mica scales, and we will call it a clay soil with sand and mica in it, or a sandy soil with clay and mica in it, depending entirely upon the proportion in which those ingredients existed in the granite. In this manner we could go through the whole series of rocks and find the kinds of soil which would come from their disintegration.

You see now how our bare rocks would sooner or later be covered by their own ground up surfaces, and where there were sharp slopes this material would be washed off and deposited in the valley below, but on the levels much of it would remain, some being carried off by heavy rains in the general surface drainage. Soil has thus been formed to a depth varying from a few inches to several hundred feet, depending upon the nature of the rock, its position, and the climate. If this was all, however, your skill would still be in vain; for seeds committed to such soil would never be heard from, at least to any profit. In fact, in some books on agriculture such material is not called soil at all, but simply earth, as distinguished from true soil. Ground up rocks then form *earth*, or soil that is barren; while productive soil needs this earth for a basis and for permanent fertility, but must have also some other ingredient, and that ingredient is *vegetable mould*. It obtains it in this wise: As soon as the bare rocks have crumbled, in fact before they have actually crumbled, but are merely loosened upon the surface, certain low forms of vegetation, such as lichens, whose spores are floating everywhere, find favorable conditions for their growth. These grow and decay, and thus the first vegetable mould is added. Generation after generation of these plants succeed each other, and presently quite a respectable soil is formed in which plants of greater size can grow and add their decay to the gradually enriching soil, and so it goes on, until even a forest growth can be supported, or crop after crop can be harvested.

In thus noting the great importance of vegetable mould, do not let me mislead you into underrating the importance of the original earth, the disintegrated rock material. You may take two lots of soil, each containing exactly the same amount of vegetable mould, and one will be fertile and the other sterile, depending entirely on the nature of the rock from which they have been made. So after all, the rocks of any section of country have a great deal to do in determining the productiveness of the soil. Examining any soil, you will find it a very complex affair. The vegetable mould will give it its brownish cast, but silica, or sand and clay, and carbonate of lime will all usually be present and give it its character. Silica in unusual proportions will make it a sandy soil; a large per centage of lime will make it a marly soil; and so it follows that a knowledge of the nature of any soil will at once suggest its needs. An over per centage of silica or clay demands lime; too much clay needs sand, etc. The per centage of vegetable mould in soils varies from one-half per cent. to seventy per cent. Less than one-half per cent. will not sustain the growth of such plants as are cultivated, while over seventy makes the soil too strong, such a soil as is only found in marshes. In the best soils the vegetable mould varies from five to ten or twelve per cent.

With reference to geology, soils may be further considered under two heads—those which are in place, that is, lying on the very rocks from which they are made, and those which have been transported and are resting upon rocks which have had nothing to do with their origin.

Let us consider *first* what geology can tell with reference to *soils in place.* In this case the soil passes very gradually into solid rock below, the gradations being so gradual that it is impossible to draw the line between soil and rock, and in many cases the lines of stratification are preserved, and even the veins of the rock below continue through the overlying soil. Under such conditions the soil is readily divided into three regions, *the surface soil,* extending to a depth of twelve or eighteen inches, through which the plough makes its way, and to which the seed is intrusted; the *sub-soil,* the next fifteen or eighteen inches; and then the rest of the mass which lies so deep that it "does not come under the observation of the practical agriculturist." Occasionally these three regions may differ from each other in original constituents, as when a clay soil rests upon a sandy sub-soil, or the reverse; but even when the material has all come from the disintegration of the same rocks, the three regions become distinct by virtue of their position. "On the surface plants grow and die; their roots penetrate through a few inches, and in the same the dead plants are buried." Thus it is that gradually the surface soil comes to contain a brown vegetable mould, which, mixing thoroughly with the original constituents, changes both its color and nature. The sub-soil is not reached directly by much organic matter in the process of decay, but more or less of the soluble products of decay are leached out by percolating waters and impregnate the sub-soil. Thus, although the sub-soil does not usually become discolored by its organic constituents, yet it has quite an appreciable proportion of them. It will eventually differ in its earthy constituents also, for the rains pouring upon the surface and sinking beneath it, carry with them all the soluble materials they can lay hold of, and even push along the finer sediments, such as fine clays in a mechanical way, until presently the sub-soil is quite distinct from the surface. Beneath the sub-soil we come to a region which has generally been undisturbed, lying at too great a depth to have been affected by organic decay, and even beyond the reach of the ordinary water carrying down soluble material from the soils above. Hence, this represents very nearly the original soil, which has been changed above by plant life and atmospheric agencies into the surface and sub-soils. Incidentally there appears here the explanation of the advantage or disadvantage of sub-soil plowing. It will be of advantage when the materials of the sub-soil, brought to the surface again, are such as are useful to plant growth; but if they are not, a diminished yield for some time will be the result. It would be a comparatively easy matter to go through the different rock formations which geologists recognize and see what kind of soil would result from their disintegration, and hence be able to determine from the rocks of any region what its soils should be. Let us, by way of illustration, take the three geological ages represented best in the Mississippi valley, and see what soils their rocks will produce. The lower silurian rocks are best characterized as masses of earthy limestone and clay shales, the latter so soft that under the influence of water they weather into a fine, very sticky mud. If the rocks are principally clay shales the soil will be a cold wet clay, and the remedy will be artificial drainage and liming. If, however, with these clay shales occur strata of earthy limestones, the soil will be limed by nature, and other conditions being favorable, will be very productive.

The upper silurian and Devonian rocks of the Mississippi valley are very similar, being principally very compact magnesian limestones, often nodular in structure. Sometimes they occur in thin beds and crumble readily, but more usually they are in thick beds, hard and compact enough to be used for building stone. Such rocks yield a reddish brown soil, often thin, light and poor, but capable of raising such crops as turnips and barley.

The sub-carboniferous rocks are sandstones and limestones. If either kind occurs exclusively the resulting soil will be poor, but better from the weathered sandstones than limestones. If, however, they occur together, as they most commonly do in this State, the result is the best soil that paleozoic rocks can produce.

The carboniferous rocks, or coal measures, consist of alternate beds of blackish clay (which is the coal shale), gray sandstone containing imbedded plants, and seams of coal. The resulting soil is always of inferior quality. The coal shales give a cold, stiff clay; the sandstones a thin barren soil. Mix the clay and sand and lime heavily is the best that can be done under such circumstances.

When I say that the rocks I have mentioned include all those found in Indiana, you may think it is a "barren" list, or a list of "barrens," and woe be to the agriculturist who lives outside of the genial sub-carboniferous rocks, or parts of the silurian. But be not too hasty in judgment, nor draw your conclusions till I have finished, and we may see Indiana redeemed yet. In concluding this part of the subject I can not say anything more appropriate than to quote the words of Prof. Jas. F. Johnston:

"A knowledge of the geology, therefore—that is, of the kind of rock which appears on the surface in every part of a country—enables us to predict generally the kind of soil which ought to rest upon it; while, on the other hand, a knowledge of the agricultural capabilities of any one district in which certain rocks are known to lie immediately beneath the soil, and of the agricultural practice suited to that district, will indicate the probable capabilities of any other tract in which the same kind of rock is known to appear at the surface, and of the kind of culture which may be most successfully applied to it. Thus it is, that the fertility of every district is dependent upon its geological structure, and a knowledge of that structure is fitted to enlighten us in regard to the nature of the soils to be expected in any district; to explain anomalies also in regard to the unlike agricutural capabilities of soils apparently similar; to indicate to the purchaser where good or better lands are to be expected, and to the improver whether the means of ameliorating his soil by liming, by marling, or by other judicious admixture, are likely to be within his reach, and in what direction they are to be sought for."

There remains to be considered *transported soils.* If I had stopped at this point your own experience might have challenged some of my statements. You might cite me to lands resting on Devonian rocks, lands in the coal measures, lands on Silurian shales, which are not thin or heavy, but as productive as any land in the State, and you would be right; but it is not the country rocks which has produced this astonishing result, it has been brought about in spite of them, may be through their aid. There comes into our problem here a factor which bids fair to vitiate all our previous results, and seems for the time to bring to agricultural geology the blush of shame. The new factor is this, that much of our soil has been transported and holds no relation whatever to the rocks which underlie it, so that you may predict a sterile soil and find a fertile one, or *vice versa.* Shifted soil can always be recognized by this feature, that the perfect soil rests on the perfect rock; there are no gradations from soil to rock as in the previous case, but the line of separation is as marked as anything can be.

"In the first place you will all recognize the fact that we may expect shifted soil in our valleys and lowlands, soil which has been carried down from higher grounds and distributed through the agency of running water. In our river bottoms, whatever may be the nature of the underlying rock, we find a rich alluvium, so universal and so productive, that "bottom lands" are synonymous with the best lands. This alluvium has come from a wide range of country, and in the case of such rivers as the Ohio or Mississippi the distance of travel may have been very great. It is simply the mixture of all kinds of soils, each correcting the other until we have the fertile product ready to support the most exhausting crops.

In our low lands, however, which can not be strictly called bottom lands we find a transported surface soil which may not have come from a very great distance. It has been most likely washed down from the neighboring hills. Most of it has been ground too fine to be able to recognize the rock from which it has come, but occasionally a considerable fragment will be found which, in the hands of a skillful Geologist will reveal the secret of its origin. It may happen that the underlying rock of the lowlands is different in character from that of the high ground. In this case the soil from the underlying rock has been overlaid by that carried down from the high ground. If the former is poor and the latter fertile, the transported soil is a blessing. If however the rocks of the high land yield a sterile soil and this covers a fertile soil disintegrated from the underlying rocks, the result is disastrous, but then much good may come from sub-soil ploughing, thus bringing the fertile sub-soil to the surface.

But transported soil is not confined to valleys or low lands; even our high lands are covered with it, often to great depths. You well know that in the northern parts of the State there is almost a universal deposit of sand and gravel, forming along Lake Michigan quite respectable hills. This great deposit you can trace southward throughout the State, nearly or quite to its southern limits. It looks as though a great sand bank had once been spread over the State. The streams have gullied their way through and carried off much of it, and later washes from the hills have covered it over in the valleys; but on the high grounds it still lies, covering all primitive soils. It has lain in this position so long that it has gradually become mixed with the original soil and profoundly modified its character. Whence has come this tremendous deposit? Geologists will tell you of a period in the earth's history called the *glacial*. At that time, throughout all high latitudes, the snow and ice had so accumulated that great glaciers began to move southward. In this country a glacier pushed its way southward in one unbroken mass from the Atlantic coast to west of the Mississippi, and finally reached about to the Ohio river. Such an immense mass of moving ice would plough deeply the whole face of the country and most soils would be swept clean from their underlying rocks, and these rocks scored and polished. Thus it is that glaciers are always pushing before them and carrying with them any amount of sand and gravel and bowlders of all sizes. Suppose now that the foot of the great glacier had nearly reached the Ohio river, when for some reason a milder condition of climate began to prevail. The ice would begin to melt and slowly retreat northward again; and in this slow melting retreat it would drop all along the immense accumulations it had been carrying, and the country would be covered by sand and gravel and bowlders, the deposit thickening and the bowlders being larger towards the north. This describes very well the condition of Indiana at the retreat of the glacier, and the glacier sand and bowlders are familiar to you all. These carried rock masses are large enough to reveal their origin, and we find that most of this drift material has been carried from the far North, especially from the rocks bordering Lake Superior. Even Lake Superior metals have been found far south in these drift gravels, masses of native copper having been found even in the gravels of this county and further south.

The agricultural importance of this drift is well nigh incalculable, for it brought us from the far north disintegrated granites and traps, rocks which do not naturally belong to us, but which, mingled with our clays, produce a mellow and productive soil. Hence I advance it as my own opinion merely that this drift has been the salvation of Indiana as a great agricultural State. Although this transported material has made the problem a more complex one, still the soil is by no means the same wherever it is distributed, for we still have appearing the influence of the country rock. Although drift has been deposited upon our native soils, they have become more or less thoroughly mixed, and the result is not what may be expected, from either native soil or drift alone, but from their combination, which is usually very beneficial. Sometimes the drift deposit has been so overwhelmingly great that the native soil has had but little influence in modifying it, and the scanty growth of what we call "barrens" is the result.

Our rich prairie lands to the north and west, which are among our high lands, owe their great fertility to the influence of this glacial material—material which could not have been spread over their surfaces except by a glacier. This mingling with their native soil has lightened it and induced a rank vegetation, which, in the course of generations, has fairly blackened the soil with a rich vegetable mould.

If the natural drainage is good, such lands are at once immensely productive, but if natural drainage is impeded for some reason these rich high lands become swampy; coarser and ranker weeds are thus induced to grow, water accumulates, and regular marshes presently rob the farmer of productive lands, and poison the air of whole counties. Thus you will find it a well attested fact that our marsh lands are our highest lands, and could not be better situated for successful draining. One of the great sanitary and agricultural problems of the State has been recently called to the attention of the public by one of my colleagues, Prof. Campbell, Director of the State Geodetic Survey, and that is the marshy grounds bordering the Kankakee river. These have become marshes in the way I have indicated, but the soil when drained will duplicate that of the splendid farms to the north and south of this malarious tract. Health and agriculture should both clamor for the draining of this area, which is at present not only useless, but positively injurious; and all of you should most heartily sanction the measures that have already been taken in this direction, and urge upon your representatives with all the persuasiveness so common in constituents that this is a State matter and should be pushed to its completion.

I have thus presented to you briefly the origin of soils, their relation to the rocks beneath and about them, their modification by transported material; and I have endeavored to make this practical by applying it to the explanation of the soils of Indiana; showing how they are almost universally productive wherever the glacial drift extends, but as a rule unproductive below its limit, for the poorest lands in this State are those along our southern borders, where the native clays have not been lightened by an admixture of drift sand.

In closing, let me make one suggestion. We have geological maps of our State upon which the rock formations are carefully traced, and from which you can fairly deduce an accurate opinion of the soils of various regions, if they have not been interfered with. While our geological maps are excellent as far as they go, they will not enable you to judge as accurately of soils as you may desire. I do not know but we have agricultural maps upon which the yield of different crops in various localities is made to appear. But what you want prepared now is a geological map of your own, a map which will give not only the various rock formations, but the materials which overlie them. The drift should be carefully studied in every county where it occurs, its constituents and its depth made out, and when these facts appear upon a map in connection with the rock formations, you have all the data you need for accurately determining the character of the soil, what crops it will grow to the best advantage, what sort of cultivation it needs; all this even without seeing it. Decide what crops you prefer to cultivate, and such a map will surely direct you to soil most suitable for them. Do not understand me as implying that the drift of our State is not being studied, for our excellent State Geologist is doing much in that direction, and I venture to predict that this part of his work will yield you richer results than any other. It is such aid that geologists offer you, and your acceptance and appreciation of it will only stimulate them to increased activity in directions which will be greatly to your profits.

DISCUSSIONS.

Question. It is a well known fact that frequently in a ten acre field in this country, on uplands, there are two or three kinds of soil. How do you account for it. There are different distinct qualities of soil with a difference of fertility.

Prof. Coulter. That comes exactly at the head of what I said about soils in general. I could not enter into such details as your question calls for. It is a fair question and can be satisfactorily explained by a knowledge of Geology and a study of the conditions of the field.

Question. You can ride through a field of corn, half leg high, and you can tell by the corn where the productive and the unproductive land is.

Answer. You can tell these different kinds of soil by understanding the plants or timber that grow upon them.

Question. We can tell them very easily by the timber that grows upon them, but then we want to know why it is so?

Answer. Take a Geologist to your field and he will tell you all about it. He can not tell you outside of your field.

Question. What kind of soil will niggerheads make if they were pulverized?

Answer. They will make very good soil.

Question. Will wheat turn to cheat?

Prof. Ingersoll. When corn turns to timothy or sorghum then wheat will turn to cheat.

SECOND DAY.

The lecture of Dr. R. T. Brown, of Indianapolis, set for Thursday forenoon at 10 o'clock, was deferred a few minutes to await arrivals from the train. The time was occupied in discussing the general nature of noxious insects and the best times and methods of preventing their ravages.

Dr Brown. What is an insect and at what period of its existence does it do its mischief?

Professor Ingersoll. I can answer it, but I would like to hear from Dr. Brown.

Dr. Brown. There is a class of animals, for they are animals, that are built up by successive rings. We call them articulates. There are several families of articulates. The lowest of them are worms. The fish worm is made up of successive rings put together. He has no legs or an indefinite number of legs. As the thousand-legged worm or as in the earth worm which has no legs. Next above that we have the insects. They are so named because they are nearly cut in two in the middle. They have three parts, in three sections. One ring called the head; it is nearly cut off; then comes the thorax or body part and the abdomen below. There are three rings forming the thorax, one forming the head; each ring of the thorax has a pair of legs and ten of the body generally, though that is not certain, but they have always six legs, four legs they use to walk with, and two they use as hands to handle things with.

I have seen philosophers, men who were profoundly learned in classics, and had for fifty years brushed flies off of their noses, who could not tell me how many legs a fly has, just for want of observation.

The spider belongs to this class. They have eight legs. They have four rings in the thorax. Then we have the crustacia; the crawfish is a represetative of it. That has ten legs or five rings on its thorax. Insects proper have nearly all of them undergone a certain amount of transformation. They begin from an egg. In that state they are not living. The egg hatches, and they pass through the larvæ state, the worm condition. They are just like worms. In that condition they are most generally called worms; they are larvæ. That is where they do the mischief principally. It is true that the villainous ten liner potato bug does eat a little after it gets into the perfect state, but very little. After they get through with that state, they go into a period of rest, generally a period of unconsciousness, apparently lifeless. They hide themselves somewhere for an indefinite period. Some lie all winter, and they wake up out of that state into a perfect animal, and come out a flying beetle, or moth, or a butterfly, or bee. The bee goes through all these transformations. He is a perfect worm for a while. It is in the first or larvæ state that our insects are our enemies. The moth that destroys our bees does not hurt anything or anybody, but it lays its eggs, spins its webb to take care of its eggs and a larvæ. After it hatches it eats its way into the honey. The hessian fly deposits its eggs on the blade of the young wheat, just after it spreads out. It lays its egg mid-rib, near the junction. When the wheat, as the Mediterranean, that has a tendency to lie down or outward, instead of inward, the larvæ are very helpless, and it rolls down and rolls off at the end and dies. But if the blade stands up as it does in white wheat, inclining inward, just as soon as it hatches it comes down to the angle, and then it fastens itself on the stock and does its mischief. Our war must be made first on the parent that lays the egg, and afterwards we must war on the larvæ while they are doing the mischief. The best way is to destroy the larvæ before it hatches, if we can while it is in the egg, or destroy the parent.

Ques. Will Paris green kill the cucumber bug?

Prof. Brown. The difficulty about that is that the cucumber bug does not eat the leaf you poison with Paris green, it is the insect that eats the leaf gets poisoned. The cucumber bug fastens himself on the stem, and sucks the juice right at the ground; the juice of it is not poisoned, therefore the bug escapes poisoning. You may make it strong enough to injure the vine, but that is not generally the case. The Paris green is arsenite of copper, and both the arsenic and the copper, the ingredients of which it is formed by chemical union, are among our worst poisons. I doubt whether the poison is absorbed by the vine. The vine does not absorb its fluid from the leaf. It exhales from the leaf, and absorbs through the roots. Were your poisons deep down where the roots run, you might get it into the fluid of the vine. But the sap of the vine does not get this poison from the leaf, the circulation is the other way.

Ques. Would carbonate of ammonia keep off insects when applied in common solution, that is hartshorn?

Ans. I have not tried it. Insects dislike the odor of carbolic acid or ammonia. I do not know what would be the result. I was going to say, while I have the opportunity, that at Washington City I made a very thorough test of the result of putting Paris green on the leaves of the potato. I kept them watered with it every day for a month with a strong solution until it began to affect the foliage. Then I dug the potatoes and tested them most thoroughly in the laboratory, and I could not by the most delicate test I had find a particle of arsenic in the tubers.

Mr. Hughes. I believe I raised more water melons on three acres this last year than all the balance of the farmers in the county except three. I think they are the nicest luxury we can raise, when taken off the vine and eaten fresh. In order to get them that way, we have to raise them ourselves. I took three acres of sandy ground that sloped down to the creek, and plowed it in the ordinary way, and laid it off eight feet each way. I then went to a spot where the furrows crossed and dug them out about a foot down into the solid ground, then I put in a large scoop full of well rotted manure. I then took the dirt and put it on top about four inches thick, without mixing, and planted my seed in that. I then covered the hill with two inches more of dirt. The watermelons grew and did well. I let the vines grow, hilling as quickly as possible in order to guard against the bugs. I used ammonia. They retained the moisture until the last part of the season. I think stirring the manure together would have had a tendency to dry the ground.

IMPROVEMENT OF CROPS BY SELECTION OF SEEDS.

BY R. T. BROWN.

Life forms are grouped into classes, orders, genera, species and varieties, by similarities in appearance, modes of growth and habits of life, and the primal law of reproduction is that each "shall bring forth after its kind." So generally has this law been maintained that we are able to classify, with a good degree of accuracy, the fossil races which sported in the waters "before the mountains were brought forth," and whose living types no human eye ever beheld. But a careful study of existing life forms, reveals the fact that an animal or vegetable may be surrounded by such circumstances, and be required to live under such conditions as will materially change many of its properties and even modify its general form. The law of heredity, which obtains equally in vegetable as in animal life, will, under a continuation of the conditions which developed the peculiarities in the parent, continue them in the offspring, and, perhaps, even intensify them. The further these aberrations from the primitive type extend, and the longer they continue, the more permanent the variety becomes. It is even claimed that these deviations from the normal form may go so far as to introduce entirely new species. But it will be soon enough to discuss this possibility when our scientists have established a sharply defined line between varieties and species, which they have not yet done.

But this question does not fall within the range of our present discussion.

Our topic to-day—the improvement of crops by the selection of seeds, will admit a discussion of the law of heredity, and the conditions under which the best seeds may be produced from which to make the proposed selection.

Modern agriculture has scarcely been more improved by the use of better implements and more scientific modes of culture, than it has by the cultivation of new varieties of grains and other crops, and the introduction of improved breeds of animals. But this advance has generally been made by professional breeders and seed growers, and a charge of fraud is often made against these, because the improved varieties are not permanent. Now, it must not be forgotten that hereditary transmission does not carry from parent to offspring, actual qualities or properties, good or bad; but only an aptitude to develop them under favorable circumstances, and that there always exists a strong tendency in all varieties, whether produced in animal or in vegetable life, to go back to the types of the species, whenever the circumstances which produced the variety are changed. Careless farmers sometimes buy, at a high price, fine stock, or improved varieties of grain—the first produced by proper food and protection added to years, perhaps, centuries of careful breeding, and the last, the outcome of thorough cultivation, and a wise selection of seed, continued through a series of years. But when the offspring falls into careless hands, and the conditions which created the peculiarities which mark the variety are no longer present, the aptitudes in those directions are not developed, and the variety rapidly retrogrades towards a lower and hardier type of its kind. It is the business of the farmer to secure, in whatever he cultivates, those properties which are most profitable to himself, and to the world that consumes his products, and it should be his first care to maintain the "survival of the fittest" for these purposes; but these deviations from the normal type of the kind produce individuals with less vitality, and less able to endure the vicissitudes of climate and the neglect of protection and high cultivation. Consequently the economy of nature is to produce a less developed but hardier race. This is the survival of the fittest for the benefit of its own kind, and not for the development and maintenance of those properties that benefit us.

All our grains, vegetables and fruits were once in a wild state, and capable of maintaining themselves by a spontaneous growth; but they were, no doubt, very different from the cultivated crops and domestic animals that we care for to-day. If we were to turn our wheat, corn and oats out to take care of themselves, how long would they survive? And if we were to withdraw our care from our domestic animals, how long would the race maintain its struggle for existence? If either of these should survive it would not be in their present development, but in a hardier form, and one that would have but few properties of high utility to us. The turnip might survive in its original form of kale, or our wheat in the form of wild rye. It is by the care of man that animals and plants have developed their valuable properties in the process of domestication. This has been, to a great extent, accidental, or, at least, with no intelligent intention to produce such results. It was not till about the middle of the last century, when Linneus gave the world the first glimpses of vegetable reproduction in his sexual system of botany, that anything was known of vegetable physiology; and not more than a hundred years have passed since Jussiew and De Condole gave to science a clear and well-defined system of vegetable physiology. The advances that have been made since that time in the production of new and improved varieties of the various crop-plants, which we cultivate, have been intelligently made. Previous to that time all the progress made in modes of cultivation and improvements in crops were made by processes purely empirical, and when favorable results were obtained, no rational solution of the phenomenon could be given. Yet it must be confessed that the progress made in this blind way by many of the ancient nations was both considerable and valuable. This is especially true of China and Japan, and Rome in the Augustinian age had made very respectable progress in many of the essential points of profitable farming, as we learn from the Georgies and Bucolics of Virgil, but the absence of science is ever and anon betrayed by absurd and ridiculous superstitions that are interwoven.

But crop improvement is now placed on a firm basis of physiological science, deduced from carefully conducted experiments and critical examination, aided by powerful microscopes, which every experimenter may now command, so that our conclusions rest on personal observations and not on mere hypothesis.

What we know of available means of increasing the yield of our crops that are fairly within our reach, may be summed up in a few paragraphs. Seed taken at random and subjected to high cultivation, and abundantly supplied with plant food in an available form, with a favorable season, will develop grain larger and more perfect than was the parent seed. But it will be observed, in this advance, that all the stalks and heads, or ears, have not advanced equally. This irregularity will be found to be more prominent in an improving or in a degenerating crop than in one that is stationary. From this crop we should make selections in whatever direction we aim to improve the crop. If it be in early ripening, the first samples that ripen should be saved for seed. If we aim at improving the size of head in wheat or ear in corn, let the selection be made on this basis.

The natural law that is to guide us in this matter is that favorable circumstances of cultivation, soil, climate, etc., promote the development of the individual plant; but this development is irregular and unequal, both with regard to the several plants and to the different parts of the same plant. If we walk through a corn field undergoing this kind of transformation we will observe some stalks that appear not to be affected in any way by the favorable circumstances in which they are placed, while their near neighbor has doubled the usual dimensions both in size of stalk and luxuriance of foliage, but the improved condition appears not to have reached the ear. Others appear to have made less advance in stalk and blade, but the improvement terminates chiefly on the size of the ear and perfection of the grain. Another still has not increased the size of the ear but has duplicated it—two ears appearing in place of one. Now, each of these improvements in special qualities of the plant may be regarded as initiative steps, each in a line of improvement that, with proper care, may be carried forward to the production of a variety having this special peculiarity. The aptitude to develop a special quality or property will be transmitted from parent to offspring by the law of heredity if cultivation, soil and season favor development in that particular direction. But if these conditions are wanting the peculiarity disappears, and the plant will retrograde towards a lower type.

But the second and each succeeding step will show great diversity in the amount of progress made, and will therefore demand a careful selection of seed each year, looking to the property or peculiarity that we seek to develop and perfect. In experiments with corn or sorghum care must be observed to place the several qualities, if more than one variety is attempted on the same farm at the same time, at such distance from each other as to secure them from the possibility of mixing by cross fertilization, which would defeat our purpose. In these crops (maize and sorghum) it may sometimes be desirable to shorten the season of the crop by producing an earlier ripening variety. To accomplish this nothing more is necessary than to select the first seed that ripens. In this manner the early amber cane has been made to ripen in ninety days from the time of planting, and the early Dent corn in one hundred days. But we must bear in mind that these are the most flexible crops that we cultivate, and if it is easy to develop particular properties these changes are correspondingly transient, and the improvements we have made will be certainly lost unless we maintain the conditions under which the advance was made. We now warn our farmer friends against buying improved seed corn at fancy prices, unless they intend to preserve it from cross fertilization with other varieties, and to maintain the high cultivation and careful selection of seed by which the variety was originated. Otherwise it will rapidly degenerate to its original type, if not below it.

Wheat is the most permanent in its varieties of any of our cereal crops. This is probably owing to its exemption from natural cross fertilization. The different varieties of wheat have been produced entirely by climate, cultivation and selection of seed. The latter means, though an important one, has been used to a very limited extent in this country. The farmer who, from an unfavorable season or other causes; harvests a crop of wheat with small heads on slender straw, yielding but eight or ten bushels per acre of small, imperfect grains, does not hesitate to use this crop for seed, regardless of the law of heredity, which inevitably transmits the impaired vitality and the aptitude to continue the degeneracy already begun.

In selecting seed with the view of improving our varieties of wheat the work should be done in the field, shortly after the milk has disappeared from the grain, as the germination of the seed will be both quicker and stronger if gathered then than at a later period. Three points should be observed in selecting seed wheat: 1st, the size and length of the head; 2d, the period of ripening; and 3d, the property tillering, or sending a number of stalks from the same grain. By observing the first and last of these conditions, Prof. Blount, of the Colorado Agricultural College, has been able to produce wheat heads ranging from six to eight inches long, giving a crop of sixty bushels to the acre.

But the second condition—that of early ripening we deem one of prime importance in this climate. Wheat is a much more certain crop in Indiana now than it was forty years ago, and this, to a great extent, is owing to our having advanced the wheat harvest at least fifteen days. At the period of ripening, wheat requires a cool atmosphere holding considerable moisture and yet giving but little rainfall. Under these circumstances the grain ripens slowly, is plump and well filled out. The heated term which set in about the 20th of June last, cost Indiana more than a million bushels of wheat by ripening the crop in a week, when it should have been ten days getting ready for the reaper. Forty years ago our red bearded, and white velvet-chaff wheats were ready for the sickle about the 10th of July, if the rust had not destroyed them before that time. The introduction of an Alabama wheat about that time brought the harvest up to the 4th of July, and the Mediterranean, which came shortly afterwards, was ready for the cradle by the 1st of July. Since then we have added several new and earlier varieties which places our harvest between the 20th and last of June.

We can by a careful selection of the earliest ripening heads, bring our harvest between the 15th and 25th of June and in doing so, we will escape the unfavorable influence of the heated term which generally sets in about the summer solstice.

But the selection of seeds is too important an element of successful farming to be left to chance, or to be done in a hap-hazzard way. As wheat and maize, or Indian corn, are our leading crops, every farmer should at once institute a systematic method of selecting seed, and raise these crops only from selected seed. The method we would propose is that adopted and successfully followed by many of the best farmers in the Eastern States and in Europe. Select and set off two lots of an acre each, more or less. Manure them highly and underdrain them, if the sub-soil is clay. Cultivate to the depth of twenty inches by sub-soiling. Plant one with the variety of corn you intend to improve, at its proper season and give it the best cultivation possible. When the corn has passed the milk stage, select as many ears as will plant an acre the next spring; and make the selection in the line that you propose to improve your crop, whether that is the number of ears, time of ripening or size of ear. Keep the remainder separate for seed to plant the general crop. Pursuing this course from year to year you can not fail to add largely to the yield of grain without materially increasing the labor or expense of cultivation. Treat the other lot with a crop of wheat in the same manner and as harvest approaches make your selection by single heads of enough seed to plant your experimental lot and use the residue as seed for the common crop. Your corn should be in a condition to cut up and remove by the middle of September so that the ground may at that time receive its wheat crop, and the wheat stubble, heavily manured, should be broken for the spring crop of seed corn.

The extent to which a transformation in any particular direction, may be carried in any of our cultivated crops, has not been definitely determined. We know that the efficient agencies to this end are special cultivation and careful selection of seed. In the wild or uncultivated state, vegetables show but little tendency to form varieties, but as soon as they become domesticated, the ever varying conditions of cultivation and seed selection begin to break up the unity of form, and varieties result. But as these were, at the earlier stages of agricultural progress, mostly accidental, the deviations from the normal type were small, and as efforts were seldom made to maintain the variety, it soon resumed the typical form substantially, if not actually.

Prof. Blount, of Colorado, has succeeded, by high cultivation and a careful selection of seed, in producing a variety of corn that bears from eight to ten well formed ears on each stock, and has yielded one hundred and sixty bushels of shelled corn per acre in our own State; and the Professor gives it as his opinion that by the cultivation of this prolific variety we can make our corn crop average one hundred bushels per acre with but little additional expense or labor. But to secure this yield, it is evident that a larger amount of plant food must be consumed, and to maintain it, and a greater care to the supply of manure will be demanded, as well as a careful selection of seed from those stalks bearing the greatest number of well formed ears. A proper caution must also be observed to prevent crossing with other varieties that may be grown in the vicinity.

Of course there is a limit to the improvement of any crop by the selection of seed, or by any other means. The development of the plant must be kept within the vital force supplied to the original germ by the parent plant. If this point is approached the crop will betray an inability to resist unfavorable conditions in its surroundings. This point has been reached in some varieties of wheat, which, in certain seasons, yield enormous crops, but fail in less favorable seasons. The same cause accounts for the want of hardiness in our best developed breeds of hogs and poultry. But a great advance may be made in this direction without incurring the danger alluded to. The point we specially insist on is that no attempt should be made to produce a crop from inferior seed. If the parent crop has suffered from a poor soil, imperfect tillage, or from any other cause, the law of hereditary transmission will carry the aptitude of degeneracy to the offspring. But the selection of seed is but one of the means employed to produce improved varieties of crop plants, we should select our seeds from those varieties furthest advanced in the direction in which we propose to improve our crop. Climate, cross-fertilization and cultivation are the three principal forces operating with selection of seed to produce and maintain varieties in our cultivated crops. The special influence exerted by climate on grain crops, has never been fully explained. All crops are more or less under the influence of climate, but not equally so. Indian corn is, perhaps, the most sensitive to this influence, and wheat the least so of any of our cultivated crops. Our large eared corn, with long grains, indented at the outer end, is found no where but in our Southern and Western States. Even tropical Brazil raises only flint corn, with long slender ears, and ten rows of grains each. Attempts have been made to introduce the small yellow flint corn of New England into the Southern States with the intention of making two crops a year, but in the course of a few years the influence of climate, conforms it to the style of common yellow corn, and to carry the experiment to success, it has been found necessary to bring seed every year from New England. New varieties of oats have from time to time been introduced into Indiana from Europe, but only a few years are required to conform these foreigners to our Hoosier type. Even wheat, which is the least flexible of our grains, feels the influence of climate and slowly conforms to it. The hard flinty grained Italian wheat, which was introduced into this country nearly forty years ago by Hon. Henry L. Elsworth, differs materially in mode of growth and character of grain from the Mediterranean wheat we are cultivating to-day. As the new process of manufacturing flour demands a hard grain, abounding in gluten, we could probably improve the quality of our grain by bringing our seed wheat from Italy or Greece, but it would likely be at the expense of the yield per acre. In the same manner we may improve the quality of our corn by selecting our seed from some of the harder and smaller varieties of corn from New York or Michigan, and the loss in the smaller size of the ear can be compensated by the closer planting. But the importation would require to be repeated at least once in ten years, in order to counteract the influence of climate and soil. The facility of cross-fertilization in maize is one of the difficulties to be encountered in efforts to maintain new varieties of this grain, but it enables every farmer to obtain nearly any variety that he wishes to cultivate. To make a cross of two varieties of corn it is best to plant a separate lot in alternate rows of each variety and select the seed from but one of the parent varieties, to secure greater uniformity in the cross. The perfect mixing will be facilitated by cutting the tassel from the mother rows before the bloom opens. For several crops the ears will show occasional grains that appear to be of one or the other of the parent varieties, but ultimately they will become uniform.

From the peculiar character of the bloom in wheat there is no natural cross fertilization, and consequently no mixing of varieties, but that end may be reached by artificial means. Several new varieties of wheat have lately been made in this manner that promise to be valuable. Attempts have been made to improve several of our grains and fruits by hybridizing species, but with no very promising results. In grains the hybrid is inferior to either of its parents, and its germinating qualities can not be depended on. In fruits, the Governor Wood cherry is the best hybrid hitherto obtained, and it has proved rather short-lived.

Some attempts are now being made to produce an early ripening variety of cotton by a selection of seed from the first ripened bolls, that give fair promise of ultimate success In China, with a climate, in the interior, differing but little from ours, cotton is successfully cultivated about the 40° parallel of latitude. Three-fourths of the bolls on cotton plants were ripened last season in Hamilton county, Indiana, and securing seed from the earliest ripening bolls, no doubt better results may be obtained next year. But it is a matter of doubt whether the acclimating of cotton to our latitude will be of any considerable value to our agriculture. A cotton plant that will perfect itself in our seasons must necessarily be small and the fiber short.

Permit us, in conclusion, to insist on a strict observance of the law governing reproduction in the vegetable world, as well as in the animal. No farmer would think of breeding live stock of any description from his promiscuous herd, without selection; and yet the physiological law transmitting qualities from parent to offspring is not more strictly enforced in the animal kingdom than in the vegetable. If the improved breeds of hogs, cattle and sheep, have added millions of dollars to the value of live stock in Indiana, why may we not make even a greater addition to our wealth by cultivating only the best varieties of grains, grasses and fruits, and not only maintaining these by high cultivation, but improving them from year to year by a judicious selection of seed. An addition of only ten per cent. to the wheat and corn crops of this State, would add more than a million of dollars annually to the value of those crops, without materially enhancing the labor of producing them. Indeed, there is no way in which money can be honestly earned with less labor than by giving proper attention to the quality of the seed that shall be the parent of our crops.

Man's earthly mission is to conquer the active forces of nature, and subdue them to his own use. At first he betook himself to that task in the dark, and though his blows were those of a giant, they were often as much against his interest as in its favor. But when science began to light up the field of conflict, his efforts were systematized. He enslaved the winds, and made the gravity of water work for him; he harnessed steam and tamed the lightnings, and made them his servants. The wild horse becomes his faithful companion, and the wild cow of India grows large of udder, far beyond the need of her offspring, under his training. The sour crab and the astringent sloes are transformed into the mellow pippin and the luscious plum; the worthless kale of the salt marsh developes into the great cabbage head, and all under man's intelligent training. But though we have subdued the plants we cultivate, and taught them to grow for our use, we must not forget that by our neglect they will break away from us, and return to their savage state—growing for their own use. Our conquest of nature is to be maintained only by constant and persistent vigilance. But of this we should not complain, for plants only follow our example. Man through centuries toils upward, with slow and labored steps, to the summit of a high civilization; but if neglected, he glides rapidly down to the low plane of barbarism and savage life. "*Facillis est decensus averni.*"

DISCUSSION.

Question by the President: Dr. Brown has spoken considerably on the subject of seed corn. As corn and wheat are our staple crops it is essential for everybody to know how to save the seeds of those two grains and obtain good and profitable seed. He has told us that corn has been made to yield from six to eight ears to a stalk, and it has been done by procuring that kind of seed. I am satisfied that the Professor's theory is correct. The subject of gathering seed corn has occupied my attention for several years. I have thought about it, and have acted to some extent upon the suggestions he has laid down. At what time, at what stage can corn be gathered to save it the best for seed?

Dr. Brown. Much earlier than most persons suppose. The germ is the first thing that perfects itself. The germ is perfected while as yet the starch part is quite soft. If you at that time gather the seed, the starch part will shrink some. At that period a great portion of the starch is yet in sugar or glucose, and has not gone into starch yet. The water will evaporate, and when you put it into the ground it does not have to go through the process of germination and convert the starch into sugar. All the starch of the corn, whether you plant it or eat it is made into sugar before you can digest it, or before it will grow. All the corn you put into the ground the starch part gets to be sugar. Plants can not eat solid food; they can not chew it. It must be soluble in water. Wheat will germinate quicker if taken in the dough than if suffered to get hard. If you have the sugar to start with, the moment it gets warm it starts right off to grow, and the process is hastened. You can gather corn just as soon as it is out of the milk, while the corn is comparatively soft. You remember when we grated corn for mush in this country. You know the stage at which it was grated on the grater in the fall, when it was not hard enough to shell off, and a little too hard for roasting ears. Now when you get it to that stage, you have it exactly at the stage it will germinate best. If you save it and hang it in a dry, cool place in the fall, and a place that never gets below zero in winter, you will have it in the best possible condition to germinate in the spring.

Question. Is there any danger of it souring or spoiling when soft?

Answer. There is if you put it away in the house. You should hang it where it will dry out nicely, then after it is dried out you should keep it where it will not be below zero. Corn if perfectly dry will stand the temperature of 10 or 15°

below zero without damage. But if it is the least moist zero will kill the germ. It is a tropical plant and will not stand a low temperature if it is moist. We paid the penalty last year for not appreciating this fact, as the winter, one year ago was a severe one. Keep your seed corn where the mice will not get it.

Question. You said we could bring our corn crops earlier by gathering the earliest ears. I have experienced this and am satisfied the theory is correct in reference to gathering the earliest ripe ears for seed. The next point is as to the gathering of the corn where there are two ears on a stalk. Would you take both of them or one. If you take one, which one?

Answer. The upper one is the principal one, the other is auxiliary. If there are half a dozen you take the upper one. Professor Blount's prolific variety has its perfect ear above and the ears become shorter and smoother as you go down. In some instances it reaches as high as two ears on a large stalk with two stalks in a hill.. If you put more you will not get more than five or six. If you put two stalks in a hill and fertilize it highly you will sometimes get ten ears. The lower ears will not grow over four inches long, but it will be a perfect grain.

Question. Is there not danger of injuring your seed corn by gathering seed that has too large a cob in it?

Answer. Yes, sir. You must look at the depth of the grain. It is a very important matter in corn to look at the depth of it downward; and the short grain, that is as broad as it is deep, gives you a big cob always, and you lose by it when you shell your corn, that kind of corn does not ripen as early. If you crib it if it does not freeze immediately the cob will undergo fermentation. If it freezes it will dry out. But if there is moisture in it, it will cause the corn to turn black at the heart.

Question. Myself and two neighbors procured some of Blounts' prolific corn last year. Out of 100 hills I got two grains. The other neighbor got more. I do not know whether it is a swindle on the part of the Indiana Farmer or not. I will not say that here, but it is evident I did not get much. What I got I took the best of care of. I had it on the best of ground. One of those hills had only one stalk. I think the upper ear was a well matured ear. Perhaps on that one stalk there was another good ear. Of course Blounts' corn can be raised in Indiana, perhaps in the Wabash valley. But I have my serious doubts whether it can be raised in Montgomery county to any profit whatever. If there is any individual here who attempted to raise Blounts' corn and succeeded, I should like to know it. It is just the corn we want to feed cattle, if it will only succeed.

Dr. Brown. I am glad of the opportunity to explain the failure that was made in the corn that was sent out from the office of the *Indiana Farmer* last spring. The circumstances were these: The *Farmer* offered several prizes, $100 for the largest yield from an acre; $50 for the next, and $25 for the third prize. The first prize was taken by a crop in Allen county, Indiana, that was measured by officers sworn for the purpose. The corn was weighed in the ear, a bushel of it was shelled in order to test it to see whether it would hold out to the measure. Then it was cribbed. Fort Wayne is colder than it is here. It was exposed during the whole winter. Three or four times the temperature fell to 5° below zero. It was exposed to that temperature with a moisture coming through all the time. The Indiana Farmer Company bought some fifty bushels of that crop. It looked well. It came to us in the ear, and we distributed it among a great many persons who sent postage stamps for it. Not more than one grain in a hundred of it grew. Those that did grow had their fertility so far destroyed that they grew feebly and imperfectly. I saw some corn that grew in Johnson county, and at Locust Grove, in Fayette county, from seed obtained of Prof. Blounts, of Colorado. The ears were good and the crop run about 100 bushels last year.

Question. Don't you believe that it is better for the farmers to raise their own seed corn?

Answer. Most certainly.

Question. Would you select an upper ear in preference to another good ear?

Answer. I should not make much difference. I should prefer the upper ear if equally good. It is generally the best ear.'

Question. I got into trouble when I was a youth in selecting seed corn, because I shelled the whole ear and put it in. I should not have taken the corn off of both ends.

Dr. Brown. Never plant a grain of corn or wheat that is not perfect. I don't care where it comes from, whether the middle or end, if it is imperfect in shape or form. There are grains which are imperfect at both ends. Reject all grains that are out of shape.

Prof. Ingersoll. I would like to say that a gentleman in England experimented with this very successfully. He took a wheat head and divided it into about three parts—the lower third, the middle third and the top third. He found the yield from the middle of the head was always the best. I also talked with Prof. Blounts, when I was in Washington in January, in reference to this matter. He thought if the kernels on the butt or base of the ear were large or well formed they were just as good to plant as those in the middle. If they were small and not equal in size they would not be so good.

The Chairman. When we all lived in log houses we gathered our seed corn and tied it together by the husks, and hung it over head where the heat was constantly going up from the big fire place. We always had good seed corn. We have a moist climate, and it does not get so dry where we can not get artificial heat from the fire place coming up into the loft. There is from fifteen to twenty-five per cent. of water in corn. When it comes cold weather that water freezes and spoils the germ. Never gather very much corn in the husk and leave it in the husk; there is a great deal of corn spoiled in that way. In hanging always keep every ear separate.

OUR HIGHWAYS.

BY HON. P. S. KENNEDY, CRAWFORDSVILLE.

So rapid has been the improvement in the means of communication in the last fifty years, that a message may now be sent to every city in the civilized world in an hour; and trains bearing hundreds of tons of produce are everywhere seen flying from metropolis to metropolis with the speed of a race horse. So far as the transmission of thought is concerned, space has been actually annihilated. We sit at our fire-sides and in our places of business, and, by means of the wonderful telephone, converse with friends fifty miles away as easily as if they were in our very presence, even recognizing the tones of a familiar voice.

The marvellous inventions by which these things are done have so absorbed our attention that we have neglected and almost forgotten the humble, neighborhood highway, which is quite as important in the world's commerce as the more speedy means of transportation, for it is a fact that every pound of produce transported by rail has to first be hauled over a wagon road from the farm to the depot. And, besides this, every farmer must go to mill, to church, to the grocery, to his post office, and to visit his neighbors—which latter he ought to do much oftener than he does, over the neighborhood road. It therefore becomes apparent at a glance, that while we are constructing railroads, putting up telegraphs and telephones, and building new houses and new barns, we ought not to neglect our common county highways.

Indiana is blessed above all the other States in the Union with railroads, there being now but one county in the State without either railroad or steamboat connection with the great network of railroads which spreads over the country. Of the 92 counties in the State all but two have railroad connection, more or less direct with the Capital, so that the daily papers published at out great central city are distributed in the course of a few hours to every city, village and hamlet in the State.

But our State is shamefully deficient in good wagon roads; and this is not, as many suppose, from lack of material out of which to construct good roads, but rather for lack of some power to give direction to the enterprise and intelligence of the people—the lack of a simple and efficient system for constructing good roads and keeping them in repair. Our present system of laws providing for the construction and repair of county highways is full of crudities and inequalities of burdens and benefits, as well as inefficient and wasteful methods.

We have in the first place the old turnpike or toll-gate plan, under which many roads have been constructed by corporations. But it has been found these roads do not pay their owners sufficient dividends, except where they run only a few miles out from large towns and cities, so that good roads can never be made general under this plan. And even if we could secure good roads everywhere under it, I yet believe it ought to be abandoned. For, besides the many annoyances connected with it, it is the most burdensome plan of maintaining good roads that could possibly be devised. If a road is owned by the county the only tax it imposes is a sum sufficient to keep it in repair. If a corporation owns it, we must pay not only enough to keep the road in repair, but in addition thereto a large sum to hire toll-gate keepers, and make dividends of 10 or 15 per cent. to the owners of the stock, for no less profits will induce capitalists to invest in it. The money paid to toll-gate keepers alone would be amply sufficient to keep the roads in first class repair, for there must be a gate keeper to about every five miles of road, and he is usually paid, at the lowest rate, $300 per annum, or more than fifty dollars to the mile. This sum would not only keep the roads in good condition, but judiciously expended, would make them better from year to year. I have been assured by many who have had long experience with gravel roads, that if they are well made in the first place, fifty dollars per mile is an ample annual allowance for repairs.

In the next place we have the plan of assessing the lands on each side of a given line of road for the purpose of grading and graveling it, and then keeping up repairs by a general county tax. Many object to this plan, and claim, with some justice, that its burdens and benefits are very unequal. It often happens that the man whose farm is just beyond the limit of assessment is benefited quite as much as the one whose farm is just within the limit. Yet the one is taxed to construct the road and the other is not. A more serious objection is that it is unreasonably expensive. Under this plan, however, many excellent roads have been made in the last few years, and there is no great complaint on the part of those who have been taxed to construct them.

In the third place we have the new law of 1881, under which a road superintendent is to be elected in each township, who is to construct and repair roads pretty much at his own discretion, with whatever funds may come into his hands for that purpose.

This law is at least a step in the right direction, and if supplemented with a provision allowing the Board of County Commissioners to levy a tax on the county generally to assist the township superintendents in constructing roads, wherever they might be necessary, in order to equalize the burdens and benefits of improved roads, would be productive of much good.

But, in my judgment, our road laws should all be wiped out and a simple system substituted, turning over to the Boards of County Commissioners and the township trustees the whole business of constructing and repairing county roads. The Boards of Commissioners should be invested with full authority to construct good roads, in their own way, wherever they deem such roads necessary. And after the roads are all properly graded and graveled, or macadamized, they should be put in charge of the township trustees, who should be required, once a year, to let out the repairing thereof, in sections, to the lowest bidder, the successful bidder to give bond with good security that he will keep the section of road under his care in good repair, allowing any one hindered or delayed, or in any way injured by his willful failure to do so, a right of action against him on his bond. Under this plan we could secure good, smooth roads the year round, and besides escape the host of superintendents and road masters.

Self-interest would suggest to the contractor the importance of keeping up repairs, for, in the first place, he would be liable to be sued on his bond if he did not; and in the next place he would soon learn that constant repairs would save him much work and make his contract profitable to him. And, in addition, this plan would be almost sure to bring into use improved machinery for repairing roads, as every contractor in the State would be interested in keeping up his repairs at the least possible cost, and the improved machinery would, of course, result in cheapening the annual cost of repairs, just as the steam-power stone crushers have lessened the cost of constructing and repairing the macadamized roads.

It would be folly to deprive the National Government of its Sovereignty over the States, or to deprive the State Government of their power to control the counties; but, at the same time, a wise policy dictates that the States should be allowed to manage all their purely local affairs as their Legislatures shall think best, and that the people of the counties should be equally free, through their local administrative officers, to manage, in their own way, all business that is purely local to the counties as separate communities, for this is the highest degree of self-government. The rest of the State is not the least concerned in the policy Montgomery county shall adopt, or the extent to which she may go, in the construction and repair of county highways, and there is, therefore, no good reason why the legislature of the State should persist in tying the hands of a community in a matter so purely local as that of the improvement and repair of county highways.

It is universally conceded that an ordinarily prudent and sensible man can manage his own business better than some one at a distance who knows little about the situation of his affairs. And it is on this principle that I hold a county can devise ways and means for its own development and improvement, better than the legislature can do it for all the counties by one general law. The several counties are differently situated—surrounded by different circumstances; a general law suitable for one county is a dead letter in another. For these reasons it is, and long has been, my deliberate judgment, that all restraint should be removed from county boards, touching the matter of constructing and repairing highways and levying taxes therefor, and that they be left as free to manage such business as an individual is to manage his farm. It is the one subject upon which entire freedom can result in no harm, because we can never have too many good roads.

Whatever is in constant use needs constant repair, and the old adage that "a stich in time saves nine," applies nowhere else with more force than to the patching of roads. In many of the old countries the plan of constant repairs has been tried with great success. It has been found that under it roads not only grow better from year to year, but that the annual expense of repairs grows perceptibly less. The great and once much-traveled highway from Toulouse to Lyons, in France, for many years, under a system of periodical work, required $500 per annum for each mile, for repairs; and then more than half the time it was in a wretched condition in many places. But after the adoption of the plan of making daily repairs, the road constantly improved in condition, and the yearly expense of repairs fell off at the rate of from fifty to sixty dollars per mile, until the whole annual cost of keeping the road in first-class condition did not exceed $100 per mile, instead of $500 as under the old plan. And such has been the result wherever the plan has been tried. True economy dictates that it should be adopted everywhere.

Another thing of great importance has been learned by actual experience, and that is, that where a road is constantly undergoing repairs, and its surface kept rounded up and free from ruts, and what wagoners call "chuck holes," a thin coat of gravel will make as firm and lasting a road as a thick one. It has been demonstrated that a six-inch coat of good gravel, on a firm, well drained foundation of clay, if kept rounded up, will turn off all water and remain solid in the wetest weather, under all ordinary use. The graveled surface being always in the form of an arch, the weight presses the pebbles closer together and aids in making the road bed solid. But when the middle is suffered to become hollowed out like a trough—the arch turned up side down as it were—the graveled face of the road soon goes to pieces and sinks in the mud. Another thing that would do much to protect our gravel roads would be the adoption of the broad-tired wagon. I am not sure but that the law ought to prohibit all heavy hauling with any other kind. I may suggest here that a very simple machine is made for drawing the gravel toward the center and filling up ruts and depressions by means of two boards fastened together like a sled, but wide apart at one end and close together at the other and ironed on the bottom. This, drawn by four horses with the wide end foremost, and sufficiently weighted, will scrape all the loose gravel at the sides to the center, fill all ruts and depressions, cause all water to run off, and keep the road always in good condition. With this simple contrivance a man and four horses will easily repair three or four miles of road per day. There is also in use a scrape consisting of a board, properly ironed, with a tongue fastened to it at an angle of about forty-five degrees, which scrapes one side at a time. This is preferred by many to the double scraper. It is made at Columbus, Ohio. If there is any one thing connected with road repairing that I would lay more stress on than another it is the necessity of keeping every part of the road in such condition that no water can stand upon it. All who have traveled on gravel roads have observed how many days depressions on such roads sometimes holds water, which proves that a well-packed coat of gravel is impervious to water, if kept in a condition that will enable the falling water to run off speedily.

But the question that is oftenest asked in this excessively utilitarian age is, will it pay? I should despair of ever persuading any one to vote for a general system of constructing and repairing highways by funds from the public treasury, unless it can be shown just how much is to be realized in dollars and cents from the expenditure for the construction and repair of public roads. And I therefore propose to address myself for a few moments to the important question, will it pay the farmer to construct and keep up first-class county roads?

I will take Montgomery county as a basis for my calculations, because I am more familiar with its condition than I am with the condition of any other county. The real and personal property of the county is assessed, in round numbers, at $15,000,000. There are perhaps three hundred miles of road in the county that ought to be improved and kept in repair, in order to furnish good roads for all the citizens of the county to their several places of business. I should say that this includes the gravel roads already made. To construct three hundred miles of gravel road at $1,500 per mile, which is a liberal estimate, would require $450,000. This is three per cent. of the taxable wealth of the county as it is rated for taxation. The real amount of wealth, as all know, is much above this sum. The average farmer of the county, as rated for taxation, is worth, I will suppose, $10,000. Three per cent. of $10,000 is $300. This is the sum it would require a farmer worth $10,000 to pay in order to secure a system of first-class free roads throughout the county. To keep three hundred miles of road in repair, at $50 per mile each year, would require an annual expenditure of $15,000, which is one-tenth of one per cent. of our taxable property. It would therefore cost the farmer whose property is rated at $10,000, $10 per annum for repairs. Is this too much to pay for the privilege of using three hundred miles of good road? From the figures here given, each individual can easily tell what it will cost him to secure and maintain a system of good free roads throughout the county. He has but to find the amount he is assessed at, and take three per cent. for construction and one-tenth of one per cent. for repairs.

Let us turn now to the other side of the account, and see what would probably be the benefits of such a system of roads. Montgomery county contains in round numbers 330,000 acres of land. The construction of such a system of free roads, I am sure would add on an average $3 per acre to the value of all the lands in the county, or $990,000 in the aggregate; for it is a fact known to all that lands, even on a toll road, always sell much more readily than lands on a common dirt road, and for from $5 to $10 more per acre. Here, then, is added to the value of the real estate of the county, at the lowest estimate, almost a million of dollars, by virtue of an expenditure of $450,000. The only reason that can be assigned why land on a good road sells higher than land on a bad road is, that the farmer who lives on a good road can make more money on his land than the one who lives on a bad road can make on his. The farmer who lives on a good road can do all his hauling in wet weather, when his ground is not in condition to plow; but the one who lives on a bad road must neglect the cultivation of his land to do his hauling while the road is dry. The farmer who lives on a good road need never waste a day, for when the weather is so he can not work on his farm he may market his grain, lumber, wood, etc.; but the farmer who lives on a bad road is compelled to be idle and keep his teams idle almost one-half of the year. Some, however, will cry out, "You are agitating new schemes of taxation." But I am not. I am agitating a scheme to get rid of taxation, for I assure you that the most burdensome taxation that ever cursed a farmer yet is a bad road to market. The farmer who has to spend half his crop to get it to market, will be kept in poverty all his life by such taxation. His time is squandered, his horses are ruined, his wagons and harness are broken, and he is sometimes induced to take the name of his Maker in vain to help him out of a rut or mud hole. All these things constitute a tax that will crush the most industrious and persevering man on earth. Why is it you pay $75 for a wagon when you can buy a sled for $10? Because you can haul so much more on a wagon, is it not? The very same reason will make it profitable to you to spend money for a good road, instead of dragging along through the mud on a bad one.

If some one should invent a wagon upon which you could haul twice as large a load with two horses as you now do, would you not all throw away your old wagons and buy the new one? Undoubtedly you would. But, as we are not likely to have the new wagon, you can accomplish the same result by constructing good roads; for you can haul twice as much in a day, on a good road, as you can on a bad one, and that, too, with much less worry, and much less wear and tear of horses, wagons, and harness. And even if you could get the improved wagon, it would cost more to supplant the old one with it than it would to improve the roads.

Money spent for a good road is not wealth consumed, like money exacted to carry on war, or money spent for tobacco and whisky. It is money invested where it will yield a very large profit. And, hence, the State injures no man by taxing him to construct a good road. It robs him of nothing, but only changes an investment, as it were. It takes from him at most a mere pittance, and invests it where it yields him an annual profit which soon exceeds the amount taken. No reasonable man will complain of this, since good roads can be secured in no other way. In conclusion, my farmer friends, let me admonish you that while you are complaining of the exactions of railroads and toll roads, not to forget the much more burdensome exactions of mud roads.

A somewhat prolonged discussion followed the paper, and it was a little after the hour when the morning session was adjourned.

AFTERNOON SESSION.

The first lecture in the afternoon was delivered by Prof. C. L. Ingersoll, of Purdue University.

ENSILAGE.

It was entitled, "Some Thoughts on Ensilage." Ensilage is a process for the preservation of fodder in subterranean pits, more or less air-tight. It is of recent date, having been first tried in Germany, about 1840. The fodder is chopped up fine by a machine, placed in a pit or trench. and compressed by covering with planks heavily weighted down. The pit, or silo, is ten or twelve feet wide, twelve to sixteen feet deep, and as long as required. Forage can thus be kept a whole year. Enthusiastic claims are made for the process, many of them extravagant. As yet it has not been tested, but the Professor would not recommend it except in the vicinity of large cities, where land is especially valuable.

THE FENCE OF THE FUTURE.

R. M. Lockhart, of Waterloo, a member of the State Board, spoke next, upon the subject of fences. Everyone knows that timber is becoming scarce in this country. The use of rail fences is certainly wasteful. Fences, even of sawed lumber, are too expensive. Hedges are not satisfactory; they generally take up more ground than rail fences, take a long time to grow and then do not afford complete protection. In this part of the country there is not sufficient stone accessible to render it suitable for fencing. Mr. Lockhart thinks that barbed wire is the coming fence, and that the best post is the iron one.

EVENING SESSION.

Mr. Johnson being absent from the evening session, Col. John Lee was selected to act as chairman. The only regular appointment for the evening was a paper by Harmon Hiatt, on

PRACTICAL GARDENING.

The garden should be situated near the residence, should be underdrained with tiling, thoroughly manured and plowed deeply. Seed should be planted in straight rows lengthwise of plat. Don't plant flowers in your garden. Don't plant too early. Test in the house a few seeds of each kind before planting. Use only good seed.

After conclusion of paper a few miscellaneous matters were discussed, and the Institute was declared adjourned.

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